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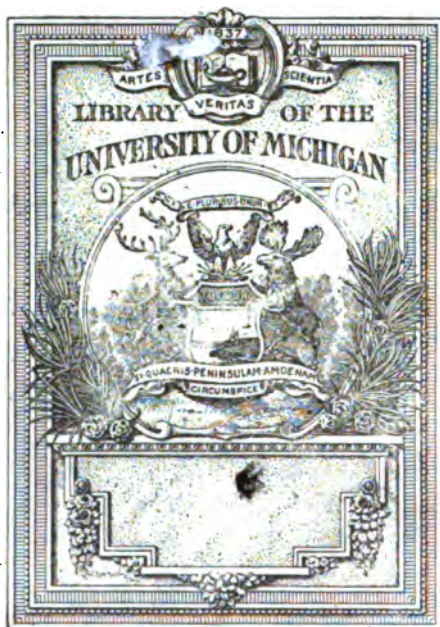
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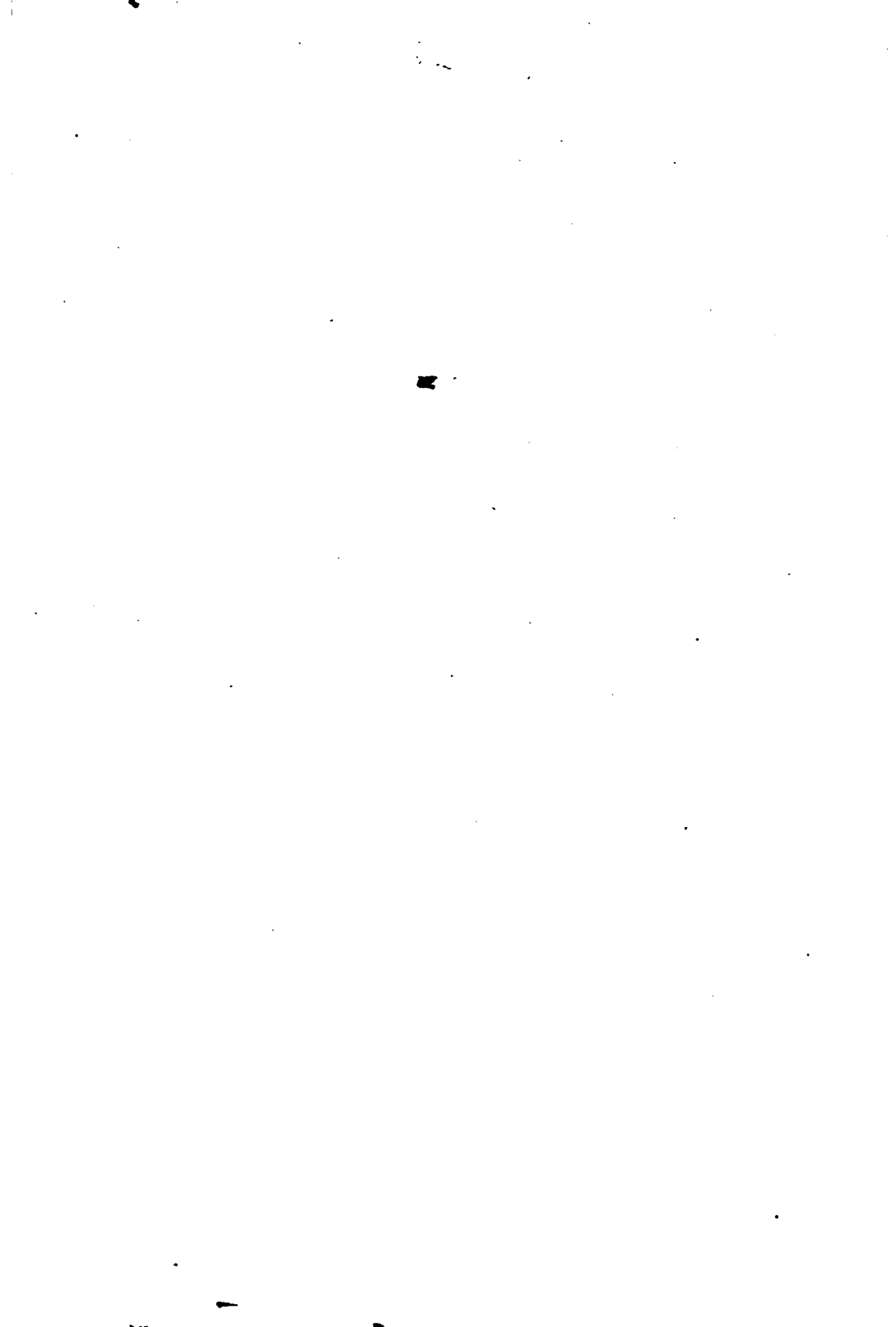
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PUBLIC DOCUMENTS

OF THE

STATE OF WISCONSIN

BEING THE REPORTS OF THE VARIOUS

State Officers, Departments and Institutions,

For the Fiscal Term ending June 30, 1906.

VOLUME 8



MADISON

DEMOCRAT PRINTING COMPANY, STATE PRINTER

1907

PUBLIC DOCUMENTS

FOR 1905-1906.

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Exhibit of Wisconsin State Horticultural Society at State Fair, Milwaukee, Sept. 11-16, 1906.

ANNUAL REPORT

OF THE

Wisconsin State Horticultural
Society

FOR THE YEAR 1906.

VOL. XXXVI.

F. CRANEFIELD, *Secretary*.

MADISON, WIS.



MADISON, WIS.
DEMOCRAT PRINTING CO., STATE PRINTER.
1906.

LETTER OF TRANSMITTAL.

MADISON, Wis., March 1, 1906.

TO HIS EXCELLENCY, JAMES O. DAVIDSON,

Governor of Wisconsin.

DEAR SIR:—I have the honor to transmit to you herewith the Thirty-sixth Annual Report of the Wisconsin State Horticultural Society.

Respectfully,

FREDERIC CRANEFIELD,

Secretary.

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CONSTITUTION AND BY-LAWS.

CONSTITUTION.

Article I. This society shall be known as the Wisconsin State Horticultural Society.

Article II. Its object shall be the advancement of the art and science of horticulture throughout the state.

Article III. Its members shall consist of annual members paying an annual fee of one dollar excepting that paid members of local societies may become members on payment of an annual fee of fifty cents, of life members paying a fee of five dollars. Wives of such members shall be entitled to the privileges of full membership; of honorary annual members who may by vote be invited to participate in the proceedings of the society and honorary life members who shall be distinguished for merit in horticulture and kindred sciences or who shall confer any particular benefit upon the society.

Article IV. Its officers shall consist of a President, Vice-President, Secretary, Treasurer, and an Executive Committee, consisting of the foregoing officers and additional members, one from each congressional district of the state, five of whom shall constitute a quorum at any of its meetings. All above officers, except Secretary, shall be elected by ballot, and shall hold office for one year thereafter, and until their successors are elected. The Secretary shall be appointed by the Executive Committee at the annual meeting, after the election of officers, and shall hold office for one year thereafter, or until his successor is appointed.

Article V. The additional members of the Executive Committee may be elected by the local horticultural societies of their respective districts in the following manner: Each of the county or local societies of the different districts shall, at a regular meeting, elect a delegate who shall have authority to cast the vote of said society; these delegates shall meet in convention at least 15 days previous to date of annual meeting of this society and vote by ballot for member of Executive Committee; and if a member of such committee is not elected from

any congressional district the vacancy may be filled by vote of two-thirds of the members present at the annual meeting.

Article VI. The term "County and local horticultural societies" shall include any organization that shall have for its sole object the advancement of the interests of its members in the growing or sale of horticultural crops; provided, that such society acts by authority of a regularly adopted constitution and makes an annual report to the Secretary of the state society.

Article VII. The society shall hold its annual meeting for the election of officers, exhibition of fruits and discussions, in Madison, commencing on the first Tuesday of February of each year and such other meetings and at such time and place as the Executive Committee may direct.

Article VIII. The President, Treasurer, and Secretary shall constitute a Board of Managers which may conduct any business deemed necessary for the society in the absence of the Executive Committee. All bills against the society must be audited by the Board of Managers before being paid.

Article IX. This constitution, with the accompanying by-laws, may be amended at any regular meeting by a two-thirds vote of the members present.

BY-LAWS.

I. The President shall preside at meetings, and, with the advice of the Secretary, call all meetings of the society, and have general supervision of the affairs of the society, and shall deliver an annual address upon some subject connected with horticulture.

II. The Vice-President shall act in the absence or disability of the President, and perform the duties of the chief officer.

III. The Secretary shall attend to all the correspondence, shall record the proceedings of the society, preserve all papers belonging to the same, and superintend the publication of its reports. He shall also present a detailed report of the affairs of the society at its annual meeting. He shall also endeavor to secure reports from the various committees, and from local societies of the condition and progress of horticulture in the various districts of the state, and report the same to the society. He shall also be Superintendent of all Trial Orchards. It shall be the duty of the Secretary to make a report to the governor of the state of the transactions of the society, according to the provisions of the statutes for state reports.

IV. The Superintendent of Trial Orchards shall supervise the planting and cultivation of the trial orchards and trial stations and shall exercise general control of the same, subject to the directions of the Trial Orchard Committee.

V. The Treasurer shall keep an account of all moneys belonging to the society and disburse the same on the written order of the President, countersigned by the secretary, and shall make an annual report of the receipts and disbursements, and furnish the Secretary with a copy of the same on or before the first day of the annual meeting. The Treasurer elect shall, before entering upon the discharge of the duties of his office, give good and sufficient bonds for the faithful performance of his duties subject to the approval of the Executive Committee.

VI. The Executive Committee may manage all the affairs of the society and fill all vacancies in the board of officers; meetings of the committee may be called by the President, the Secretary or by the Secretary on written request of five members.

VII. Regular meetings of the Board of Managers shall be held bi-monthly to audit accounts and transact other business; special meetings may be called by any member of the Board.

VIII. The standing committees of this society shall be as follows:

1st. Committee on Finance, consisting of three members.

2d. Committee on Nomenclature and New Fruits, consisting of three members.

3d. Committee on Trial Orchards and Trial Stations, consisting of three members, and such other committees as may be determined from time to time to be necessary. Said committees to be appointed annually by the President. .

IX. It shall be the duty of the Finance Committee to settle with the Treasurer and to examine and report upon all bills or claims against the society which may have been presented and referred to them.

X. The Trial Orchard Committee shall have general control of the locating, planting and care of all trial orchards or trial stations, and shall visit collectively each orchard or station once each year or oftener if deemed necessary. Meetings of the committee may be called at any time by the President of the society or by the Superintendent of Trial Orchards.

MEMBERSHIP ROLL.

LIFE MEMBERS.

Allis, Frank W.....	Madison, Wis.
Ames, W. L.....	Oregon, Wis.
Ayer, Ed. E.....	Lake Geneva, Wis.
Babcock, O. W.....	Omro, Wis.
Barnes, A. D.....	Waupaca, Wis.
Brown, F. G.....	Madison, Wis.
Buckstaff, D. C.....	Oshkosh, Wis.
Bussey, W. P.....	Omro, Wis.
Cashman, Thos. E.....	Owatonna, Minn.
Carpenter, L. A.....	Fond du Lac, Wis.
Carver, N. E.....	Bayfield, Wis.
Chandler, S. S., Jr.....	Waupaca, Wis.
Chappel, F. H.....	Oregon, Wis.
Coe, R. J.....	Ft. Atkinson, Wis.
Cole, W. B.....	Pleasant Prairie, Wis.
Converse, D. C.....	Ft. Atkinson, Wis.
Eaton, B. A.....	S. Milwaukee, Wis.
Edwards, F. C.....	Ft. Atkinson, Wis.
Fiebing, J. H.....	Milwaukee, Wis.
Foley, M. F.....	Baraboo, Wis.
France, N. E.....	Platteville, Wis.
Guilford, W. S.....	Pecatonica, Ill.
Hager, W. S.....	West De Pere, Wis.
Hanchett, W. H.....	Sparta, Wis.
Harden, F. A.....	Weyauwega, Wis.
Harris, N. W.....	Lake Geneva, Wis.
Harland, F. W.....	Milwaukee, Wis.
Herbst, J. L.....	Sparta, Wis.
Hudnall, Geo. B.....	Superior, Wis.
Hutchinson, C. L.....	Lake Geneva, Wis.
Johnson, Franklin.....	Baraboo, Wis.
Jones, John D.....	Elk Grove, Wis.

Jones, G. D.....	Wausau, Wis.
Kellogg, L. G.....	Ripon, Wis.
Kellogg, Geo. J.....	Lake Mills, Wis.
Kellogg, M. S.....	Janesville, Wis.
Kierstead, E. H.....	Oregon, Wis.
Kreutzer, A. L.....	Wausau, Wis.
Loop, A. J.....	North East, Penn.
Loope, T. E.....	Eureka, Wis.
Malde, O. G.....	Madison, Wis.
Marshall, S. H.....	Madison, Wis.
Menn, J. J.....	Norwalk, Wis.
McGregor, E. L.....	Appleton, Wis.
Raymer, Geo.....	Madison, Wis.
Rentschler, F.....	Madison, Wis.
Rietbrock, Fred.....	Milwaukee, Wis.
Riordan, D. E.....	Eagle River, Wis.
Ryerson, M. A.....	Lake Geneva, Wis.
Saxe, Arthur.....	Whitewater, Wis.
Seubert, John.....	Cologne, Minn.
Simonson, Andrew.....	Racine, Wis.
Smith, Irving.....	Green Bay, Wis.
Steele, W. H.....	Pewaukee, Wis.
Taylor, Will L.....	Mt. Hope, Wis.
Tilson, Mrs. Ida.....	West Salem, Wis.
Toole, W. A.....	Baraboo, Wis.
Toole, William.....	Baraboo, Wis.
Underwood, J. M.....	Lake City, Minn.
Vaughn, B.....	Grand Rapids, Wis.
Webb, W. H.....	Superior, Wis.
Williams, Daniel.....	Oconomowoc, Wis.
Wright, Arthur.....	Milwaukee, Wis.

HONORARY LIFE MEMBERS.

Bailey, Prof. L. H.....	Ithaca, N. Y.
Case, F. W.....	Chicago, Ill.
Hinkley, M. E.....	Mt. Vernon, Iowa.
Patten, C. G.....	Charles City, Iowa.
Periam, Jonathan.....	Chicago, Ill.
Phoenix, F. H.....	Delevan, Wis.
Philips, A. J.....	West Salem, Wis.
Trelease, Prof. Wm.....	St. Louis, Mo.

ANNUAL HONORARY MEMBERS.

Banderob, Hon. John.....	Oshkosh, Wis.
Beach, Prof. S. A.....	Ames, Iowa.
Brackett, A.....	Excelsior, Minn.
Bryant, Arthur.....	Princeton, Ill.
Crawford, M.....	Cuyahoga Falls, Ohio.
Frost, Prof. W. D.....	Madison, Wis
Gordon, Dr. W. A.....	Oshkosh, Wis.
Hedrick, Prof. U. P.....	Geneva, N. Y.
Reeves, Elmer.....	Waverly, Iowa.
Rowe, Geo. E.....	Grand Rapids, Mich.
Street, H. G.....	Hebron, Ill.
Underwood, Roy.....	Lake City, Minn.
Whetzel, Prof. H. H.....	Ithaca, N. Y.

ANNUAL MEMBERS.

Adams, W. H.....	Eagle River, Wis.
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Arp, Diedrich.....	Milwaukee, Wis.
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Balsden, Jas.....	Lake Geneva, Wis.
Barlow, Geo.....	Lake Geneva, Wis.
Barret, Miles.....	Lake Geneva, Wis.
Barret, Jas.....	Williams Bay, Wis.
Bauer, Carl.....	Cedarburg, Wis.
Beach, S. A.....	Ames, Iowa.
Bennett, Wm. F.....	Norwood Park, Ill.
Bennet, A. E.....	Grand Rapids, Wis.
Beule, E. A.....	Fox Lake, Wis.
Bevens, O. N.....	Milton, Wis.
Bingham, D. E.....	Sturgeon Bay, Wis.
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Blackman, H. B.....	Richland Center, Wis.
Bodenstein, F.....	Madison, Wis.
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Bowman, F. F.....	Madison, Wis.
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Brainerd, C. P.....	Boscobel, Wis.

Brandenburg, O. D.....	Madison, Wis.
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Brown, F. M.....	Madison, Wis.
Brown, A. D.....	Poplar, Wis.
Brown, A. D.....	Baraboo, Wis.
Brown, S. L.....	Madison, Wis.
Brown, A. W.....	Watertown, Wis.
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Christensen, H. C.....	Oshkosh, Wis.
Christensen, H. E.....	Milltown, Wis.
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Cooper, H. O.....	Hillside, Wis.
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Diley, J. F.....	Rush Lake, Wis.
Downey, W. J.....	Whitewater, Wis.
Downing, M. B.....	Milton, Wis.
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Edwards, A. J.....	Ft. Atkinson, Wis.
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Everett, C. H.....	Racine, Wis.
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Fleming, Frank	Lake Geneva, Wis.
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Hodges, W. A.	Waunakee, Wis.
Hollister, A. H.	Madison, Wis.
Hopson, E. V.	Madison, Wis.
Howie, John	Waunakee, Wis.
Howlett, Mrs. Marcia	Oshkosh, Wis.
Howlett, Mrs. D. D.	Oshkosh, Wis.
Hurry, Wm.	Lake Geneva, Wis.
Ihrig, J. J.	Oshkosh, Wis.
Illenberger, H. W.	Lake Geneva, Wis.
Irwin, R. A.	Lancaster, Wis.
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Kroupa, Wencil.....	Racine, Wis.
Kuehne, Frank.....	Lake Geneva, Wis.
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Larson, Hans.....	Lake Geneva, Wis.
Laue, A. F.....	Milwaukee, Wis.
Launer, Geo.....	Chicago, Ill.
Lee, Carl E.....	Mason, Wis.
Leverich, J. W.....	Sparta, Wis.
Loewe, Arthur P.....	Milwaukee, Wis.
Longland, Wm.....	Lake Geneva, Wis.
Loope, Eva.....	Eureka, Wis.
Lugger, Humbolt.....	Madison, Wis.
Mack, S. B.....	Monroe, Wis.
Madison, Chris.....	Lake Geneva, Wis.
Marsh, Thomas.....	Waunakee, Wis.
Marshall, W. S.....	Madison, Wis.
Martens, Henry.....	Lake Geneva, Wis.
Mason, E. L.....	Hillsboro, Wis.
Meler, Albert.....	Madison, Wis.
Melcher, Henry.....	Oconomowoc, Wis.
Menn, Ella.....	Norwalk, Wis.
Mexner, J. W.....	De Forest, Wis.
Millar, Fred.....	Lake Geneva, Wis.
Miller, Luther.....	Chicago, Ill.
Mills, Genevieve.....	Madison, Wis.
Milward, J. G.....	Madison, Wis.

Mitchell, Jas.....	Lake Geneva, Wis.
Montgomery, L. E.....	Reedsburg, Wis.
Moore, J. G.....	Madison, Wis.
Moore, Wm.....	Delavan, Wis.
Morefield, Clarence.....	Lake Geneva, Wis.
Moseley, J. E.....	Madison, Wis.
Moyle, Mary.....	Union Grove, Wis.
Moyle, W. J.....	Union Grove, Wis.
Muehleisen, G.....	Tell, Wis.
Mueller, William.....	De Forest, Wis.
Muhlenkamp, Fred.....	Sparta, Wis.
Muller, Miss E. T.....	Waukesha, Wis.
Mutch, Spencer.....	Jewett, Wis.
McCarthy, Wm.....	Albion, Wis.
McConnell, T. F., Jr.....	Ripon, Wis.
McDonald, John.....	Lake Geneva, Wis.
McKay, W. G.....	Pardeeville, Wis.
McKay, John M.....	Pardeeville, Wis.
McLay, Geo. R.....	Janesville, Wis.
Naftz, Henry E.....	Sauk City, Wis.
Neilson, Alex.....	Lake Geneva, Wis.
Newhouse, K. K.....	Clinton, Wis.
Niles, Raymond.....	Lake Geneva, Wis.
Nourse, H.....	Bayfield, Wis.
Oakley, Mary.....	Madison, Wis.
Oaks, Mrs. Charles.....	Omro, Wis.
Ogilvie, Robt.....	Verona, Wis.
Ogle, James P.....	Urbana, Ill.
Ohlenschlager, Walter.....	Oconomowoc, Wis.
Oleson, Janes P.....	Ripon, Wis.
Olin, J. M.....	Madison, Wis.
Orr, E. D.....	Mt. Hope, Wis.
Otis, B. F.....	Sturgeon Bay, Wis.
Ovenden, Frank.....	Madison, Wis.
Paige, Mrs. W. S.....	Madison, Wis.
Palmer, L. H.....	Baraboo, Wis.
Palmer, J. S.....	Baraboo, Wis.
Park, W. J.....	Madison, Wis.
Parsons, W. A.....	Ft. Atkinson, Wis.
Parsons, A. A.....	Omro, Wis.
Paulson, J. E.....	Manitowoc, Wis.
Payton, A. J.....	Oshkosh, Wis.
Pearson, C. L.....	Baraboo, Wis.
Peck, Wm.....	Baraboo, Wis.
Pelton, Geo.....	Reedsburg, Wis.

Peterson, Chas. A.....	Orange, Wis.
Peterson, P. A.....	Poplar, Wis.
Pfeiffer, A. F.....	West Bend, Wis.
Philipson, C.....	Oshkosh, Wis.
Planta, R. F.....	Milwaukee, Wis.
Post, Lewis.....	Madison, Wis.
Post, Lawrence.....	Mt. Horeb, Wis.
Pride, C. A.....	Milwaukee, Wis.
Proudfit, A. E.....	Madison, Wis.
Quinn, Michael.....	Lake Geneva, Wis.
Ramsey, Mrs. Robt.....	Baraboo, Wis.
Rastall, Benj.....	Viola, Wis.
Ray, Joseph.....	Madison, Wis.
Read, Geo. A.....	Lake Geneva, Wis.
Redeling, Henry.....	Marinette, Wis.
Reek, Joseph.....	Madison, Wis.
Reinen, C. C.....	Sun Prairie, Wis.
Reis, John.....	Ithaca, Wis.
Reeve, J. S.....	Appleton, Wis.
Remington, R. R.....	Baraboo, Wis.
Rentschler, Geo.....	Madison, Wis.
Reupke, Albert.....	Lake Geneva, Wis.
Richardson, C. L.....	Chippewa Falls, Wis.
Riegle, G. W.....	Madison, Wis.
Riley, James.....	Bloom City, Wis.
Roe, J. W.....	Oshkosh, Wis.
Rosenow, Henry E.....	Oconomowoc, Wis.
Rosenow, Arthur.....	Oconomowoc, Wis.
Rouse, Mrs. Nelson.....	Oshkosh, Wis.
Rundell, B. L.....	Livingstone, Wis.
Ruste, C. O.....	Blue Mounds, Wis.
Ryall, B. R.....	Grand Rapids, Wis.
Ryan Sam J.....	Appleton, Wis.
Sampson, Robt. J.....	Lake Geneva, Wis.
Sandegard, Chris.....	Lake Geneva, Wis.
Sandell, Harvey.....	Madison, Wis.
Sandgren, Ed.....	Lake Geneva, Wis.
Sandsten, E. P.....	Madison, Wis.
Schilt, Peter.....	Lake Geneva, Wis.
Searing, A. G.....	Ashland Jct., Wis.
Shephard, Geo.....	Lake Geneva, Wis.
Sidney, J. A.....	Poplar, Wis.
Simon, H.....	Baraboo, Wis.
Simonson, L. A.....	Baraboo, Wis.
Skewes, E. B.....	Union Grove, Wis.

Skinner, E. B.....	Madison, Wis.
Skinner, Mrs. Lloyd.....	Madison, Wis.
Sligh, John.....	Lake Geneva, Wis.
Slaby, E. G.....	Madison, Wis.
Smith, B. H.....	Tiffany, Wis.
Smith, S. S.....	Green Bay, Wis.
Smith, G. B.....	Green Bay, Wis.
Smith, Mrs. J. Q.	Madison, Wis.
Smith, A. J.....	Lake Geneva, Wis.
Soblie, Jos.....	Lake Geneva, Wis.
Sperbeck, M. V.....	Oshkosh, Wis.
Sprague, Theo. J.....	Eagle, Wis.
Spry, John.....	Ft. Atkinson, Wis.
Stark, Frank.....	Randolph, Wis.
Stiehl, C. J.....	Black River Falls, Wis.
Steensland, Halle.....	Madison, Wis.
Steinman, Henry J.....	Milwaukee, Wis.
Stephens, J. W.....	Fond du Lac, Wis.
Straka, E. E.....	Kellnersville, Wis.
Spaulding, C. F.....	Oconomowoc, Wis.
Sumner, Ed.....	Madison, Wis.
Swartz, John F.....	Kenosha, Wis.
Swenholt, Jonas.....	Madison, Wis.
Tamblingson, R.....	Ft. Atkinson, Wis.
Telfer, Joe.....	Ft. Atkinson, Wis.
Ten Eyck, A. A.....	Brodhead, Wis.
Thrall, W. E.....	Omro, Wis.
Thwaites, Mrs. R. G.....	Madison, Wis.
Tice, Jess.....	Waunakee, Wis.
Tift, Geo. L.....	Milwaukee, Wis.
Tiplady, John.....	Lake Geneva, Wis.
Timms, C. J.....	Ripon, Wis.
Tittlemore, J. N.....	Oshkosh, Wis.
Tollman, Henry.....	Lake Geneva, Wis.
Tomkins, W. M.....	Ashland, Wis.
Topolinsky, John.....	Lake Geneva, Wis.
Treleven, Jos. D.....	Omro, Wis.
Trowbridge, Geo.....	Lake Geneva, Wis.
Turnquist, Aug.....	Bayfield, Wis.
Turtle, Henry.....	Lake Geneva, Wis.
Turville, Thomas.....	Madison, Wis.
Tuttle, H. B.....	Valley Jct., Wis.
Umlauf, Rudolph	Dorchester, Wis.
Updike, E. G.....	Madison, Wis.
Utter, Delbert.....	Caldwell, Wis.

Vivian, Fred.....	Mineral Point, Wis.
Von Lanyi, Oscar.....	Neillsville, Wis.
Voss Heinrich J.....	Lake Mills, Wis.
Walker, Geo.....	Sawyer, Wis.
Wallin, Austin.....	Madison, Wis.
Walstead, Wm.....	Lake Geneva, Wis.
West, John B.....	Whitewater, Wis.
Weyerhorst, H. C.	Oshkosh, Wis.
Whittlesey, S. N.....	Cranmoor, Wis.
Wilder, A. P.....	Madison, Wis.
Wilkins, A. P.....	Delavan, Wis.
Williams, Norman G.....	Shiocton, Wis.
Williamson, W. D.....	Madison, Wis.

OFFICERS AND COMMITTEES FOR 1906.

President, T. E. Loope.....	Eureka
Vice-President, R. J. Coe.....	Ft. Atkinson
Treasurer, L. G. Kellogg.....	Ripon
Secretary, F. Cranefield.....	Madison

EXECUTIVE COMMITTEE.

T. E. Loope, Chairman.....	Ex-Officio
R. J. Coe.....	Ex-Officio
L. G. Kellogg.....	Ex-Officio
F. Cranefield.....	Ex-Officio
1st Dist., Alex. Johnson.....	Lake Geneva
2nd Dist., S. H. Marshall.....	Madison
3rd Dist., Wm. Toole.....	Baraboo
4th Dist., F. W. Harland.....	Milwaukee
5th Dist., Henry Melcher.....	Oconomowoc
6th Dist., L. A. Carpenter	Fond du Lac
7th Dist., J. J. Menn.....	Norwalk
8th Dist., W. P. Bussey.....	Omro
9th Dist., Irving Smith.....	Green Bay
10th Dist., R. B. Johns.....	Wausau
11th Dist., C. L. Richardson.....	Chippewa Falls

COMMITTEE ON FINANCE.

Irving C. Smith.....	Green Bay
M. V. Sperbeck.....	Oshkosh
J. J. Menn.....	Sparta

COMMITTEE ON TRIAL ORCHARDS.

R. J. Coe, Ft. Atkinson, Term Expires.....	Feb., 1909
W. J. Moyle, Union Grove, Term Expires.....	Feb., 1908
D. E. Bingham, Sturgeon Bay, Term Expires.....	Feb., 1907

SUPERINTENDENT OF TRIAL ORCHARDS FOR 1906.

The Secretary.

TRIAL ORCHARDS.

Wausau.....	Marathon County
Eagle River.....	Vilas County
Medford.....	Taylor County
Poplar.....	Douglas County
Barron.....	Barron County

LISTS OF FRUITS RECOMMENDED FOR CULTURE IN WISCONSIN.*

APPLES.

Alexander, Astrachan (Red), Ben Davis, Dominion, Fall Orange, Fameuse (Snow), Golden Russett, Haas, Hibernial, Lowland Raspberry, Longfield, McIntosh, Malinda, McMahan, Newell, Northwestern Greening, Oldenburg (Duchess), Patten Greening, Perry Russett, Pewaukee, Plumb Cider, Scott, Tolman (sweet), Utter, Wealthy, Westfield (Seek-no-further), Willow Twig, Windsor, Wolf River, Yellow, Transparent.

FIVE VARIETIES FOR FARM ORCHARD.

Lowland Raspberry, Northwestern Greening, Oldenburg (Duchess), Plumb Cider, Wealthy.

CRABS.

Hyslop, Lyman, Martha, Sweet Russet, Whitney.

PLUMS.

Of the three classes of plums commonly cultivated, viz., European, Japanese, and Native or American, the last named is the most reliable.

NATIVE.

De Soto, Forest Garden, Hammer, Ocheeda, Quaker, Surprise, Wyant.

EUROPEAN.

Lombard, Moore's Arctic, Reine Claude (Green-gage).

*The behavior of varieties of fruits is influenced very largely by environment. The conditions of soil, exposure and latitude over such an area as the state of Wisconsin vary greatly and no list can be given that will prove satisfactory in all localities. The following provisional lists were prepared jointly by the Committee on Revision of Fruit Lists and the Secretary. Hardiness of plant and fruit bud has been the leading thought in the selection of varieties.

The "Fruit Lists" which appeared in former volumes have been abandoned. For technical descriptions of varieties leading to the identification of specimens the reader is referred to the "Catalogue of Fruits," issued by the American Pomological Society.

JAPANESE PLUMS.

Abundance, Burbank, Red June.

CHERRIES.

Early Richmond, Montmorency.

GRAPES.

Brighton, Concord, Delaware, Diamond, Green Mountain, Moore's
Early, Worden.

BLACKBERRIES.

Badger, (Ancient) Briton, Eldorado, Snyder.

STRAWBERRIES.

Varieties starred have imperfect flowers and must not be planted
alone.

Bederwood, *Crescent, Clyde, Dunlap, Enhance, Gandy, Glen Mary,
*Haverland, Lovett, *Sample, Splendid, *Warfield.

TWO VARIETIES OF STRAWBERRIES FOR THE FARM GARDEN.

Dunlap, *Warfield.

RASPBERRIES.

Black: Conrath, Gregg, Kansas.

Red: Cuthbert, Loudon, Marlboro.

Purple: Columbian.

CURRENTS.

Red: Red Dutch, Long Bunch Holland, Victoria.

White: White Grape.

Black: Lee's Prolific, Naples.

GOOSEBERRIES.

Downing.

PEARS.

On account of the prevalence of blight and winter killing, pears are
not generally recommended for Wisconsin. Good crops are occasion-
ally produced under favorable conditions, especially in the southeast-
ern part of the state. The following list includes both early and late
varieties. List prepared by W. J. Moyle.

Bartlett, Clapp Favorite, Early Bergamont, Flemish Beauty, Idaho,
Kieffer, Lawson, Seckel, Sheldon, Vermont Beauty.

TREES AND SHRUBS RECOMMENDED.

EVERGREENS.

For screens and windbreaks—Norway Spruce, White Spruce, White Pine.

For hedges and screens for shearing—Norway Spruce, American Arbor Vitae, Red Cedar.

For lawns—Norway Spruce for backgrounds. For groups—American Arbor Vitae, Red Cedar, White Spruce, Colorado Blue Spruce.

For small lawns—Arbor Vitae, Savin Juniper, Mugho Pine.

DECIDUOUS TREES.

The more desirable ones are starred, and a further selection of five is indicated by double stars:

**American Elm, Box Elder, Black Cherry, Carolina Poplar, **Green Ash, *Hackberry, Honey Locust, Larch, **Linden, **Norway Maple, *Scarlet Maple, **Silver Maple, *Sugar Maple, Scarlet Oak, *White Oak, White Ash.

DECIDUOUS ORNAMENTAL TREES.

This class includes smaller deciduous trees of more value for ornament than for shade or defense.

Cut-leaved Weeping Birch, Tartarian Maple, Ginnala Maple, Kentucky Coffee Tree, Mountain Ash, Weeping Willow, Russian Mulberry.

LIST OF SHRUBS RECOMMENDED.*

<i>Scientific Name.</i>	<i>Common Name.</i>
<i>Berberis vulgaris</i>	Common Barberry
<i>Berberis vulgaris</i> var. <i>atropurpurea</i>	Purple-leaved Barberry
<i>Berberis Thunbergii</i>	Thunberg's Barberry
<i>Corylus maxima</i> var. <i>purpurea</i>	Purple Filbert
<i>Diervilla florida</i>	Weigela (rose)
<i>Diervilla candida</i>	Weigela (white)

*From Bulletin 108, Wisconsin Experiment Station, by F. Craneheld.

<i>Diervilla hybrida</i> var. <i>Desboisii</i>	Desbois's Weigela
<i>Eleagnus argentea</i>	Silver Berry
<i>Euonymus Europaeus</i>	Strawberry Tree
<i>Hibiscus Syriacus</i>	Althea
<i>Hippophae rhamnoides</i>	Sea Buckthorn
<i>Hydrangea paniculata</i> gr.	Garden Hydrangea
<i>Lonicera Ruprechtiana</i>	Ruprecht's Honeysuckle
<i>Lonicera Tartarica</i>	Tartarian Honeysuckle
<i>Ligustrum Amurense</i>	Amur Privet
<i>Morus Alba</i> var.	Tea's Weeping Mulberry
<i>Philadelphus coronarius</i>	Mock Orange
<i>Philadelphus coronarius</i> var. <i>aurea</i>	Golden Mock Orange
<i>Philadelphus inodorus</i>	Mock Orange, large fl.
<i>Potentilla fruticosa</i>	Shrubby Cinquefoil
<i>Prunus nana</i>	Russian Almond
<i>Rhodotypos kerrioides</i>	Rhodotypos
<i>Rhus Cotinus</i>	Smoke Bush
<i>Ribes aureum</i>	Missouri Flowering Currant
<i>Robinia hispida</i>	Rose Acacia
<i>Rosa rugosa</i>	Japanese Rose
<i>Sambucus nigra</i> var. <i>aurea</i>	Golden Elder
<i>Spiraea Bumalda</i>	Bumalda Spiraea
<i>Spiraea Bumalda</i> var.	Anthony Waterer Spiraea
<i>Spiraea Billardii</i>	Billard's Spiraea
<i>Spiraea Douglassi</i>	Douglas' Spiraea
<i>Spiraea Japonica</i>	Japanese Spiraea
<i>Spiraea salicifolia</i>	Meadow Sweet Spiraea
<i>Spiraea Van Houtte</i>	Van Houten's Spiraea
<i>Syringa Persica</i>	Persian Lilac
<i>Syringa villosa</i>	Chinese Lilac
<i>Syringa vulgaris</i>	Common Lilac
<i>Tamarix Pallasii</i> Desv. (<i>Tamarix Amurense</i> Hort.).....	Amur Tamarix
<i>Viburnum Opulus</i> vr. <i>sterile</i>	Snowball

ROSES.

Hardy garden—Harrison Yellow, Persian Yellow, Madame Plantier.

Twelve varieties hybrid perpetual—Paul Neyron, Mrs. J. H. Laing, Gen. Jacqueminot, Dinsmore, Marshall P. Wilder, Coquettes des Blanches, Earl of Dufferin, Jules de Margottin, Vick's Caprice, Magna Charta, Prince Camille de Rohan, General Washington.

Moss roses—Perpetual White, Salet, Paul Fontine, Henry Martin.

Climbers—Prairie Queen, Russel's Cottage, Seven Sisters, Gem of the Prairies, Crimson Rambler.

COMPARATIVE HEIGHT AT MATURITY OF DIFFERENT
SHRUBS.

The height at maturity of the different species must be considered when planting in groups or borders. This will depend so much upon their environment that it is difficult to give the height in feet that any species may be expected to attain. When different kinds are planted under like conditions it may be assumed that relative heights will be maintained. The following may serve as a partial guide in planting:

Tall—10 to 15 Feet.

Barberry (Common)	Lilac, Common
Barberry (Purple-leaved)	Lilac, Japanese
Golden Elder	Lilac, Jossika's
Honeysuckle, Fly	Mock Orange
Honeysuckle, Slender	Sea Buckthorn
Honeysuckle, Tartarian	Siberian pea tree (tall)
Honeysuckle, Tartarian white	

Medium—6 to 10 Feet.

Crandall Currant	Silver Berry
Honeysuckle, Blue	Strawberry Tree
Japanese Rose	Spiraea, Billiards
Lilac, Chinese	Spiraea, Douglas
Purple Filbert	Spiraea, Three-lobed
Rose Acacia	Spiraea, Van Houten's
Russian Almond	Weeping Mulberry
Siberian Pea tree (dwarf)	Wiegela

Dwarf—2 to 6 Feet.

Althea	Spiraea, Anthony Waterer
Barberry, Thunberg's	Spiraea, Ash-leaved (Sorbaria)
Cinque Foil	Spiraea, Bumalda
Honeysuckle, Albert's	Spiraea, Japanese
Hydrangea	Spiraea, Meadow Sweet
Rhodotypos	Spiraea, Plum-leaved

A LIST OF NATIVE SHRUBS DESIRABLE FOR PLANTING ON
HOME GROUNDS.

<i>Scientific Name.</i>	<i>Common Name.</i>
<i>Arctostaphylos Uva-ursi</i>	Bearberry
<i>Ceanothus Americanus</i>	New Jersey Tea
<i>Cephalanthus occidentalis</i>	Button Bush
<i>Cimaphila umbellata</i>	Prince's Pine

<i>Comptonia aspleniflora</i>	Round-leaved Dogwood
<i>Cornus stolonifera</i>	Red Osier Dogwood
<i>Dirca palustris</i>	Leatherwood (Wickopy)
<i>Epigaea repens</i>	Trailing Arbutus
<i>Euonymus atropurpureus</i>	Wahoo
<i>Hypericum pyramidatum</i>	St. John's Wort
<i>Ilex verticillata</i>	Winterberry (Holly)
<i>Juniperus procumbens</i>	Trailing Juniper
<i>Myrica Gale</i>	Sweet Gale
<i>Physocarpus opulifolia</i>	Ninebark
<i>Rhamnus catharticus</i>	Buckthorn
<i>Rhus typhina</i>	Staghorn Sumac
<i>Rhus glabra</i>	Smooth Sumac
<i>Rhus copallina</i>	Dwarf Sumac
<i>Ribes rubrum</i>	Wild Red Currant
<i>Ribes floridum</i>	Wild Black Currant
<i>Rosa lucida</i>	Wild Rose (tall)
<i>Rosa blanda</i>	Wild Rose (dwarf)
<i>Rubus odoratus</i>	Purple-flowered Raspberry
<i>Rubus Nutkanus</i>	White-flowered Raspberry
<i>Sambucus Canadensis</i>	Common Elder
<i>Sambucus pubens</i>	Scarlet Elder
<i>Shepherdia Canadensis</i>	Shepherdia
<i>Symphoricarpos racemosus</i>	Snowberry
<i>Symphoricarpos vulgaris</i>	Coral Berry
<i>Taxus baccata</i>	Ground Hemlock
<i>Viburnum lentago</i>	Sheepberry
<i>Viburnum dentatum</i>	Black Haw
<i>Viburnum acerifolium</i>	_____
<i>Viburnum opulus</i>	Bush Cranberry
<i>Zantoxylum Americanum</i>	Prickly Ash

BLACK LIST .

A LIST OF SHRUBS ALL OF WHICH HAVE BEEN TESTED ON
THE GROUNDS OF THE EXPERIMENT STATION AT MADI-
SON AND FOUND UNSATISFACTORY.

<i>Scientific Name.</i>	<i>Common Name.</i>
<i>Azalea arborescens</i>	Rhododendron
<i>Azalea viscosa</i>	Rhododendron
<i>Azalea nudiflora</i>	Azalea
<i>Azalea mollis</i>	Azalea
<i>Calycanthus floridus</i>	Sweet-scented shrub
<i>Caryopteris Mastacanthus</i>	Blue Spiraea
<i>Chionanthus Virginica</i>	White Fringe
<i>Clethra alnifolia</i>	Sweet Pepperbrush
<i>Colutea arborescens</i>	Bladder Senna
<i>Cornus florida</i>	Flowering Dogwood
<i>Cydonia Japonica</i>	Japanese Quince
<i>Daphne Cneorum</i>	Daphne
<i>Daphne Mezereum</i>	Daphne
<i>Deutzia gracilis</i>	Slender Deutzia
<i>Eleagnus longipes</i>	Goumi
<i>Ezochorda grandiflora</i>	Pearl Bush
<i>Forsythia suspensa</i>	Golden Bell
<i>Halcsia tetraptera</i>	Snowdrop tree
<i>Itea Virginica</i>	Virginian Willow
<i>Kerria Japonica</i>	Kerria
<i>Ligustrum vulgare</i>	Common privet
<i>Paulownia imperialis</i>	Paulownia
<i>Prunus cerasifera</i> var. (<i>Prunus pissardi Hort.</i>)	Purple-leaved Plum
<i>Prunus Japonica</i>	Flowering Almond
<i>Prunus triloba</i>	Flowering plum (double)
<i>Spiraea Arguta</i>	Arguta Spiraea
<i>Spiraea Thunbergii</i>	Thunberg's Spiraea

The plants of certain of the above named varieties made a good growth each year but have not blossomed unless given thorough winter

protection. In this class are Bladder Senna, Flowering Almond, Flowering Plum and Golden Bell.

The Japanese Quince is hardy of bush but has not borne flowers except when given winter protection. The Goumi will only bear fruit when protected in winter. The double-flowered Almond will blossom freely if given thorough winter protection, otherwise it will kill back severely. The double-flowered Plum grows well and after a mild winter will bear flowers in advance of the leaves; unreliable, however, four years out of five if unprotected.

The others of this list have either died outright or else barely survived.

BUSINESS CARDS OF MEMBERS.

Adams, W. H., Eagle River, small fruits.
Barnes, A. D., Waupaca, nursery and fruit farm.
Bingham, D. E., Sturgeon Bay, nursery and fruit farm.
Brown, A. D., Baraboo, I. X, L. nursery.
Chappel, F. H., Oregon, nursery.
Coe, Converse & Edwards Co., Ft. Atkinson, nursery.
Downing, M. B., Milton Nursery.
Fancher, W. E. Corliss, Nursery.
Ferguson, F. J., Wauwatosa, nursery.
Foley, M. F., Baraboo, nursery.
Hager, W. S., West Depere, small fruits.
Hanchett, Wm., Sparta, small fruits.
Hatch, A. L., Sturgeon Bay, nursery and fruit farm.
Herbst, J. L., Sparta, small fruits.
Johnson, Franklin, Baraboo, small fruits.
Jeffrey, Geo. J., Milwaukee, small fruits and orchard.
Kelley, A. N., Mineral Point, fruit farm.
Kellogg, L. G., Ripon, nursery and small fruit.
Kellogg, Geo. J. & Sons, Janesville, nursery and fruit farm.
Loope, T. E., Eureka, nursery and small fruit.
McKay Bros., Pardeeville, nursery.
Moyle, W. J., Union Grove, nursery.
Parsons, A. A., Omro, fruit farm.
Palmer, L. H., Baraboo, small fruits.
Pearson, C. L., Baraboo, small fruits.
Post, Lewis, Madison, small fruits.
Phillips, A. J., West Salem, nursery and fruit farm.
Ray, Joseph, Madison, fruit farm.
Ramsey, Robt., Baraboo, fruit farm.
Reis, John, Ithaca, fruit farm.
Richardson, C. L., Chippewa Falls, small fruits.
Rentschler, F., Madison, greenhouse.
Rentschler, Geo., Madison, greenhouse and nursery.
Roe, J. W., Oshkosh, fruit farm.
Smith Bros., Green Bay, market garden and small fruits.

Spry, John, Ft. Atkinson, small fruits.

Stark, Frank, Randolph, fruit farm.

Tamblingson & Son, Ft. Atkinson, nursery.

Toole, Wm., Baraboo, pansy specialist.

Toole Bros., Baraboo, seed corn.

Underwood, J. M., Lake City, Minn., nursery.

Utter, Delbert, Caldwell, fruit and vegetables.

Wilkins, A. P., Delavan, nursery.

Williamson, W. D., Madison, tree protectors.

Williams, Norman G., Shiocton, nursery.

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

SUMMER MEETING.

Oshkosh, Wis., August 29th, 1905.

MORNING SESSION.

The meeting was called to order by the President, Dr. T. E. Loepe, at 10:30 o'clock, in the City Hall.

After the invocation had been offered by Rev. W. F. Fox, the president introduced the mayor of Oshkosh, who delivered an address of welcome.

ADDRESS OF WELCOME.

HON. JOHN BANDEROB, Mayor of Oshkosh.

Mr. President, Ladies and Gentlemen of the Wisconsin Horticultural Society:

In behalf of the citizens of Oshkosh I extend to you our best and most cordial greetings and a hearty welcome to our city. The people of Oshkosh are especially pleased to have you hold your meeting in our city, and we shall try to make your visit with us both pleasant and profitable. If we can in any way assist you in your labors during your convention we want you

to consider ourselves at your service. I want to tender you my congratulations for the beautiful display of flowers and fruit you have made here, showing the products that can be produced in a garden and made possible only through your untiring efforts and continuous study, the result of which is a great benefit to your fellowmen and for which you deserve great credit.

At this time it may be fitting to turn back and speak about the first garden ever tilled by the human family. The first garden that we know of or read about in the Scriptures was in the western part of Asia, several thousand miles from this place, the birthplace of man and the cradle of civilization. According to Moses this garden was called the Garden of Eden. We read that the Creator had this garden prepared with a great deal of care for Adam and Eve, and to realize the condition of the garden at that time and contrast it with gardens at the present time; to see how the first human beings were started in gardening and note the developments that have been made, is what I would like to impress upon your minds. Adam and Eve, it seems, got married and the garden was turned over to them as a wedding gift. We find no record of a wedding trip, at least they did not do as they do nowadays, but we take it for granted that they were fond of each other and were prepared to start housekeeping at once and till their garden. According to Moses Adam and Eve were very happy people, and they were contented and economical in their mode of living. Eve would not even buy goods enough to make an apron and Adam was about in the same condition. It seems economy was their strong forte at that time, but things have changed a great deal since that time. For myself I like to see a woman who is economical, but I think Eve carried economy to the extreme in doing without material for garments for both of them until the leaves began to grow. Both Adam and Eve took charge of the garden and were told to make use of the fruit that grew there, with the exception of the apples that grew on one particular tree. This tree was not to be molested, the apples were not to be eaten, and if they did so dire punishment would be meted out to them. It appears that the apples on this forbidden tree were the most luscious and tempting in the whole garden, and Eve soon found this out and induced Adam to pick and eat some of this forbidden fruit. Adam yielded to Eve's solicitation and they both ate of the fruit with the result that they were driven out of the garden. I be-

lieve if we had been there we would have followed Eve's advice, for it is in the nature of things that the ladies know better the taste of good things than do the men.

This, my friends, was the first attempt at horticulture, and at the same time the first act of wrong doing of which we have any knowledge, and this occurred about six thousand years ago. That forbidden fruit must have been luscious to the taste and beautiful to look at. Since that time great improvements have been made in the art and science of horticulture.

We hope your meeting here will be a benefit to your society, and when you have concluded your labors and return to your homes our best wishes will go with you. We trust your stay in Oshkosh will always be a pleasant memory. I thank you.

RESPONSE.

PRESIDENT T. E. LOOPE.

I find nothing on the program to indicate that the President of the Society has any right to make a response to the address of welcome, and I am very glad of that for the sake of the President. I wish to say, however, that we are under deep obligations to our friend, the mayor, for his many compliments. We always take such compliments very naturally and believe we are entitled to a great many more than we get. There is nothing small about us in that respect. There is only one thing that the mayor said to which I would object. He did not tell us how wise we were. He said we had perseverance and all that, but he did not dilate upon our knowledge, and I want to tell you that our wisdom is beyond measure.

But I want to get back to that garden. In the Garden of Eden Adam and Eve did not have the codling moth, the curculio, the tent caterpillar, the monilia or any of the fungous troubles. They had nothing of that kind to contend with. We have all these things and a great many more, and the human race has some very hard things to fight against. Just think, you cannot take a breath without breathing into your system thousands and millions of bacteria at this moment. I often think it is a wonder

how we exist in that we have so much more to contend with than our ancestors, and I think we are entitled to a great deal of credit for living at all.

We are very glad to accept the gracious hospitality of the beautiful city of Oshkosh. We have with us this morning quite a noted man, one whom I have known for a good many years, when he was just a common man and a doctor in a country town, and he does not need much of an introduction from me. I have the pleasure of introducing to you Dr. W. A. Gordon, superintendent of the State Hospital.

HORTICULTURE.

DR. W. A. GORDON, Superintendent State Hospital.

Horticulture has the most dignified history of any human occupation.

According to the sacred writings, the Lord God was the original horticulturist.

He planted the first garden and placed the man he had created in charge.

As men and nations have kept close to the soil, they have been successful and happy.

The accumulation of men in great cities is responsible for the greater part of the sorrow and suffering in the world.

Sin, disease and pain are largely the products of cities.

The decay of nationalities begins in the cities.

The rush of modern peoples to the great centers of population is the sure prognostic of degeneration and extinction.

A great city is more terrible than the desert.

New York is an unopened abscess, San Francisco is a carbuncle, Chicago is a vast cancer, Philadelphia is a corroding ulcer.

These pathological spots on our nation must be cleansed, disinfected, in fact, destroyed, unless the life blood of the entire republic is to be poisoned.

The crowding of people in cities is a national suicidal delusion, a sociological insanity.

The noises, smoke and polluted waters, the child labor, sweat shops and dance halls, the pornographic press, gambling hells and tenement houses, degrade, debauch or damn all classes of society.

City life is utterly abnormal.

Nature never intended men to dwell amid the mephitic surroundings inseparable from city life.

One of the leading functions of all horticultural associations should be the sending of missionaries to bring families from the city hell to the country heaven.

"Back to the garden" should be the shibboleth not only of horticulturists but of all patriotic citizens.

If the churches would consecrate the treasure they are using for the christianization of the Orient for the gardenization of America, they would do a thousand times the good and immeasurably advance the cause of that righteousness which exalteth a nation.

Every family on earth should have a garden.

Every human being should know something of the sweetness and beauty of the world.

If Oshkosh were spread out over Winnebago county, if Milwaukee were spread out all over the state, how much better it would be for all the people of Wisconsin.

China, the greatest agricultural nation, has outlived numberless kingdoms, principalities and powers that based their civilization on the decaying life of cities.

The government of France and the parliament of England are greatly exercised over the inferiority of the people of Paris and London, so manifest has become the degeneracy of the dwellers in these proud capitals.

It is absolutely certain that the day is not remote when they will be "one with Nineveh and Tyre."

Our own great cities are on the same road.

City tenement houses and flats are the strongholds of sterility, divorce, polyandry and polygamy.

A ten story building is an assault on the rights of man.

Thieves, loafers, beggars, tramps, confidence men, highwaymen and bunco games are some of the flowers of city civilization.

His life is artificial, benumbing, trivial and commonplace.

Health foods made from refuse barley, and wheat that is too poor for flour; pure Vermont maple syrup; butterine; aniline

flavoring extracts; embalmed beef and adulterated medicines are among the fruits of city industry.

The potato bugs, chinch bugs and curculio caterpillars of the country are sources of wealth compared to the human drones, pests and parasites that abide in metropolitan palaces and hovels.

The amusing snobbery, the phenomenal conceit and the monumental impertinence with which city ignoramuses mention the dwellers in the rural districts, is an index of the blighting, narrowing influences of city surroundings.

The fortunate man who dwells in contact with our great, sweet, serene mother earth is scorned by the urbanite and called a yokel, a hayseed and a rube. He is looked upon contemptuously and treated superciliously.

A city dude, stained by cigarettes, sodden from French cordials, enervated by Parisian vices, clothed in London garments and speaking an English dialect, flouting a virile and virtuous American farmer, is a sight to make a patriot weep.

As well might a lowly tumble bug, plying his vocation on the highway, scorn the prancing stallion whose neck is clothed with thunder, who paweth in the valley and mocketh at fear.

The pallid and poisoned human product of cities can't tell parsnip from pigweed; he can't milk a cow, harness a horse or set a hen; he is ignorant, weak and helpless in the presence of nature.

His life is artificial, benumbing, trivial and commonplace.

The other day a chemist analyzed a lemon pie made in a large Chicago bakery. It was made of starch, saccharine and coal tar flavoring extract. It contained neither sugar, eggs or lemon.

A man who is fool enough to feed on wilted vegetables, cold storage fish and eggs, stock yards sausage and Chicago pie, hasn't brains enough to vote right and is incapable of self government, hence, all cities are ruled by bosses and plundered by grafters.

The city is a horrible organization for the enslaving, dwarfing and extermination of humanity.

The human wolves, sharks, rats and cats that are so plentiful in all large cities, were bright eyed, innocent, eager, hopeful boys and girls when they left the farm for the slime.

"Rescue the perishing" must be our motto.

The wretches, who live in tunnels and basements, under the sidewalks, who are caged in elevators and buried in lightless of-

fices, who live and die in abominable boarding houses, need the truth and the light more than the happy heathen who are picking wild grapes and swimming in the sundown summer seas.

The foundation of freedom is the home.

A house without children, a grandmother, a bible and a garden is not a complete home.

There are but few homes in cities.

The electric railroads have made it possible to have our cities torn down and the poor deluded inhabitants brought to the orchards, meadows and gardens.

All factories should be in the country, where every family could have two or three acres and keep a cow and have fruit, flowers and fragrance for the children.

A nation without homes, respectable and lovable, cannot long endure.

The city is the destroyer of homes.

The city men are only half developed; they are the most imperfect specimens known to science.

They prevent the progress of the race; they are a barrier against perfection.

The work of the horticulturist is the cleanest, healthiest and sweetest in the world.

A gardener, who raises one bushel of carrots, is of greater value to the state than all the brokers now on earth.

The parents should train the children to respect, to honor agriculture as one of the very few perfectly rational pursuits.

The reason that the young people are so eager to leave the beautiful and wholesome fields for the vile and ugly town is because they have not been properly treated at home.

Father has too much land and mother too much work to make the home attractive.

A piano, books, a bath tub and a few modern conveniences and personal devotion to the little ones would keep them at home.

The farms of Wisconsin average over a hundred acres.

A farmer doesn't need a hundred acres any more than he needs a harem.

Twenty acres of good land is too much for any man to cultivate thoroughly.

A beautiful home is the most beneficent institution on this earth.

Every man who has ten good acres and one good woman to love him and a few children to look upon him affectionately possesses all that is required to make a paradise in Wisconsin.

The reason paradises are not more frequent is because the fathers do not know enough to fashion them from the materials ready at their hands.

The fool who brow beats his wife and bullies the young ones won't have any paradise.

The imbecile who values booze or dollars or his own way in everything more than the respect of his wife and the affection of his offspring will not inhabit the bowers of bliss.

Neither religions, philosophies, arts, sciences, literatures, wealth, honor, power or fame will lead a man into the earthly paradise.

Our nature is such that love of a woman and the affection of children is necessary to make a man truly blessed, to make his life complete, to take him to the ultimate goal of life triumphantly.

The man with the hoe and ten acres can have this felicity if he works for it, if he is entitled to it.

The first duty of the horticulturist with ten acres and the hoe is to cultivate himself to a reasonable degree; he must keep his hair cut and use the bath tub whenever he has a chance and not use improper language when meals are not ready on time.

He must never forget those supremely wise words, "Man shall not live by bread alone."

He must let that other scriptural aphorism, "A man's life consisteth not in the abundance of the things which he possesseth" control his career.

The wise horticulturist knows that the boys and girls are the greatest crop that can be raised on any soil in any climate.

During the winter evenings, there must be poetry and other inspiring literature for the children.

The boys should swim the Hellespont or cross the Delaware or defend Thermopylae or capture Vicksburg.

The cultivation of enthusiasm for great books cannot be neglected without irreparable injury to the family.

The elevating examples of men of genius must exalt the intellectual tone of the home.

Luther Burbank is probably the greatest and most useful man now living on this globe.

The story of his life should be familiar to every horticultural family.

If the home is not fertilized by the great wise books, it will be a barren place.

Paradise must have many flowers: roses, morning glories, hollyhocks, carnations and sun flowers are absolutely essential, and there must also be a honeysuckle by the bedroom window.

There must be an ice house and apple trees and bees, cherry trees and chickens, clover, two cows, strawberries, raspberries, spear mint for the roast lamb, basswood trees for their fragrance, crab apple trees for their exquisite perfume, a turkey gobbler for his strut, summer savory, dill, sage and horse radish for the kitchen, and thrushes in the orchard and meadow larks back of the barn.

There will be moon light and star light and the fructifying sunshine and gentle dew and sweet rain upon the tender leaves.

There will be the glory of the clouds, the enchanted air and the rapture of the sky.

The family will "help Hyperion to his horse" and sleep in Elysium.

Golden summers and mellow autumns will bring the rewards earned by honest, intelligent labor.

"Let not ambition mock their useful toil."

Pleasure, peace and plenty are on the ten acres.

Bosses, strikes and lockouts do not molest or walking delegates make afraid.

The ten acre farm is the only spot under the stars and stripes where there is absolute liberty and perfect independence.

THE ASTER.

MRS. D. D. HOWLETT, Oshkosh.

The aster is called the "Old Maid's Flower." I know no reason for this unless it may be its precision; being very exact in its outline of leaf, branch and flower. If it is the old maid's flower, it certainly partakes of the nature of the stately, modern old maid, whose health and strength attract a far greater

number of admirers than the less durable qualities of her delicate and dependent sisters.

The botanical name of the aster is, *calistophus*; from the Greek, meaning "a crown." But the aster has many meanings; it means astral or starlike. It has an unspoken language, all its own, and tells us of beauty and cheer. It has also its significance in the language of flowers. This language originated in the Orient and was carried to western Europe by Lady Montague. It was during the reign of Charles XII that the English speaking people learned the art of letter writing with blossoms. A flower placed in an upright position expresses a particular sentiment. If the flower is reversed it has the contrary meaning. The aster signifies "variety"; hence the Old Maid's flower means—I love variety—the spice of life.

I think I can trace the advent of the aster in the town of Algoma.

About fifty-five years ago a family came to this locality from Ohio, bringing with them the seed of what they called "Fall Roses", but which were later known as China asters.

These flowers, as I remember them, some ten years later, sprang up in the grass where they had been planted presenting single or semi-double crowns of purple and of crimson.

The aster, like all improved plants, and also animals, when illy cared for or left to shift for themselves, will degenerate or "run out," as it is termed, and eventually return to the type from which it originated.

A wonderful improvement has been made in the aster in even this short space of time. The flower as first brought from China about one hundred and seventy-five years ago was single like a daisy and now we have aster blooms so double and fluffy as to closely resemble the finest chrysanthemums in appearance. It may be that some Miller, Velmorin or Luther Burbank may overcome the aster's one disadvantage, that of odor, or rather lack of it, and we shall have a better aster than our "peony-flowered perfection." Mr. Burbank was once accosted as "the man who improves upon nature," and he replied, "No, sir. I only direct some of her forces."

In speaking of the aster it is generally conceded to mean the showy annual so universally admired; yet there are several varieties of perennial which are entirely hardy in this locality. Among them are *Nova Anglae*, the New England aster, of two varieties, blue and purple, and a white.

The asters now commonly cultivated are the descendants of a class of flowers brought from China in 1731, by a Jesuit missionary. Philip Miller, a famous English botanist, had as early as 1753 produced double asters. But the greatest improvement has been made since then, in France and Germany, where the best seeds are said to be produced. From the three countries, England, France and Germany, the aster has received a name—Queen Marguerite—French aster—German aster. America alone was willing to call it China aster in respect to its native land.

The aster has, at present, many distinct types, and as tastes differ I see no better mode of satisfying one's self in regard to varieties, than by growing them. Anyone may, by consulting any first class descriptive catalog, select varieties to suit his needs as to earliness, size of plant or flower and type better than I can tell; though the selection of varieties is an important factor in success or failure for any particular purpose.

In growing the young plants a sunny window is much better than a hot bed, as with the bottom heat and conditions of the latter, the young plants are liable to damp off. My method is to sow the seed in a shallow box, some six inches in depth, filling with good mellow earth to one and one-half inches from top. Saturate the earth and allow to drain off. Sow the seeds in rows about two inches apart, not too thickly, and cover with earth about one-fourth inch deep. The young plants will appear in from eight to twelve days. They should remain in the rows until the second or third leaves appear and should then be taken out and placed in other similar boxes, two inches apart in the rows; or if the season is sufficiently advanced they may be set in an especially prepared bed out of doors to remain until they are two or three inches high, when they should be transplanted to the garden rows in which they are to bloom. Transplanted in this manner they make much stronger plants than when sown in the open ground where they are to bloom.

At the time of sowing the seed, cover the top of the box with glass and set in a sunny window. The temperature should not go below 55 degrees at night nor above 75 degrees in the daytime. Water carefully and only when no water collects on the under side of the glass. If heavy drops of water form, the soil is too wet and the glass should be removed for a time. While the seeds are germinating the soil should never be allowed to become absolutely dry. If the plants remain in the

seed box until the leaves touch the glass, raise the glass by means of blocks across the corners of the box. Stir the soil between the rows as soon as you can see them, using a table fork or similar utensil.

As it takes from four to six months to bring the aster to perfection, it is necessary to sow the seed in February or early in March to insure blossoms before danger of frost. The earlier varieties may be sown in the open ground about the time the first trees come into leaf. If the seedlings are grown properly they will stand nearly as much frost as lettuce or cabbage.

The garden bed should be well enriched with well rotted barnyard manure before plowing. Make a trench for the young plants and fill it with pulverized earth, sprinkled with unleached hardwood ashes, to the depth from four to six inches. Plants should either be set in a moist time or watered carefully upon setting. To prevent withering plants should retain earth upon the roots when reset; otherwise it takes much time and strength from the plants to recover from the shock. Plants should be set in garden bed from eight to eighteen inches apart according to variety; they should be kept entirely free from weeds and the soil should be stirred after each rain as soon as dry enough.

When the plants are from four to eight inches high a dressing of fine manure and wood ashes may again be applied. This should be well hoed in as the top dressing acts as a mulch and prevents drying out. The ashes serve as a fertilizer and make the earth too strong in alkali for some of the insect pests.

Many recommend potash and commercial fertilizers, but I have used nothing except the common materials to be found about any farm. Fresh manure should not be used as it will cause the plants to look sickly and scorched. Liquid fertilizer, not strong, may be used frequently with beneficial results, but one must use care in not allowing it to touch the foliage.

In order to raise the largest flowers, it is necessary to remove many of the branches, leaving only a few on each plant; and all but the terminal bud on each of these should be removed. I have a number of plants carrying but the main stalk and the blooms of these are enormous. The aster is much like the chrysanthemum in the care that it requires, also in its gross feeding qualities. It will survive with little care but requires careful culture to thrive. The conditions of culture are so numerous that one must speak in a general way and say, give the

plants intelligent care. They are easier to understand than humans because they quickly show their likes and dislikes.

Nearly all cultural directions agree that one should have a rich, loamy, friable soil for aster culture; and when I tell you that the soil on which I raise my asters is a red, heavy clay, which if not tilled just at the proper time, assumes a resistance scarcely less than adamant, you will probably feel that my asters are a failure; but I have plants three feet high and blooms six inches in diameter and I have told you how I obtained them.

I have had little trouble with the pests; but there are a few however, namely: the black beetle, black and green lice, green worm (similar to cabbage worm) and worm in roots. Blight will not bother with proper soil preparation and cultivation. The best method of destroying black beetles is to brush them into a pan of hot water or a small amount of kerosene. Sprinkle with paris green for worms and spray with tobacco water or kerosene emulsion for lice.

Now in writing this essay on asters I have been conscious that you received a much better one on the same subject at your winter meeting. I am a farmer's wife and have a limited amount of time and means to expend upon flower culture; but, like the old farmer at the convention:

“I thot I'd come an' give ye
Any pointers thet I could;
T' let the greatest number
Hev the most amount o' good.”

A FEW INSECTS INJURIOUS TO SHADE TREES.

C. E. BUES, State Nursery Inspector.

The commercial value of an ornamental or shade tree does not simply consist in the number of feet of lumber, or in the number of cords of firewood which it contains. Only a very short time ago did an American court render a verdict directing a telephone company to pay damages for a disfigured tree, on the basis of the *sentimental* value attached to it by its owner.

What prompts us to plant shade trees? Surely we have inherited the love for shade from a certain line of tailed ancestors, who are notorious for their love of tree tops. But if you look over the development of a Wisconsin farm, you will find in most cases that first, all trees were cut when the land was cleared by the settler, later, when he had time to enjoy the fruit of his labors, he planted again, around the house for *aesthetic reasons*.

Now, the value of any commodity is determined by the degree of our desire for it. Everybody knows that the desire for life in a certain town increases with the increase in the beauty of that town, called forth by more green trees along the streets and in the public places. *Therefore, beautiful shade trees are a commercial asset of that town.*

The closeness of planting of the same varieties of trees increases the liability of diseases and insect pests being carried from tree to tree. The fact that somebody else owns the trees next to yours renders it difficult for you to keep your trees clean, if your neighbor does not keep his clean. You should not be made to suffer for this. In paying taxes to run the town or city administration, you acquire the right to demand the protection of the town or city. While it is not such a serious matter to spray a few small shade trees to spray trees from thirty to seventy-five feet high requires power pumps. It requires a rather expensive outfit.

To do successful work in combating shade tree pests, except on isolated trees, co-operation is an absolute necessity.

In talking about *insects* injurious to shade trees, I would use a few of the worst pests of this state to illustrate the two kinds of poison used. *Sucking insects can not be killed by feeding them Paris green*, for they do not eat the surface of the leaf.

If you have any kind of an insect injuring your trees, or other crops, first you must find out does it chew, does it eat holes into the leaves. If that is the case, you can in most cases kill that insect by spraying its food plant with an arsenical poison. All caterpillars are of this kind. Just give them the cold mitten by holding out a glad hand in an extra carefully prepared breakfast.

If the insects do not chew holes into the leaves, but suck the sap of the tree, either at the leaves and juicy stems, as the plant lice do, or at the woody branches, as many of the scale insects

do, then you must kill them by a *contact* poison. Such poisons are either caustics, like tobacco or potash, which burn through the skin; or they are *greasy* or finely divided materials, which choke up the breathing pores on the sides of the insects. Remember these poisons are *contact poisons*, and they will kill no insect which they do not strike when thrown into the tree.

As an insect passes through several stages in its life cycle, in which it lives often under very different conditions, and has a very different appearance, it is necessary for us to follow it through its metamorphosis of egg, larva, pupa, and adult, to find a weak point where we may attack it.

Now we are going to take up our first insect, one that has probably done more injury to shade trees of late years than any other one, and which comes under our group of *sucking* insects.

THE COTTONY MAPLE SCALE. (*Pulvinaria Innumcrabilis* Rathv.)

Nearly all of you are familiar with this noxious louse which is destroying the shade trees of southeastern Wisconsin.

From June 1st on it becomes conspicuous by the white, waxy, cottonlike egg nests, which protrude from the hind part of the brown scale, the hibernating female. Within this cottony nest are laid from 500 to 2,000 eggs, hatching from about June 20th to August 1st, according to season. The young lice crawl like a yellowish powder spread over the tree and settle down on the leaves, preferring the underside along the leaf ribs, but by their number often compelled to go to the upper surface. They insert their sucking beak into the leaf and commence to draw upon the sap of the tree, secreting a scale above their backs. After molting, the males and females differentiate; finally in August the winged males emerge. They mate with the females, which stay under their scales. Then the males die. Shortly before the leaves fall, the females move camp and travel back to the twigs, where they stay over winter. They are now about 1-16th inch long and brown in color. When sap flow starts in the tree, the insects commence to feed and grow like mushrooms after a warm rain. They draw the sap so fast that a great quantity secreted as honey dew drops on the sidewalks, making them dangerous for the traveler, especially after a rain. Now the cottony mass is secreted again and the egg-laying period begins again.

It has been maintained that epidemics of the cottony maple scale last only a few years and that their natural parasites hold them in check. It is true they have many enemies among insects, especially the lady beetles, *Aphis lici*, and some little Chalcid flies, and probably not more than one per cent matures in some seasons, but on the other hand one per cent may mean a twenty-fold increase yet.

If we have epidemics like we had this year and last year in southeastern Wisconsin, our trees are in danger and we must act. Soft maples, box elder, basswood, black locusts, are worst infested. A great many other trees and shrubs are less congenial to the insect.

There are several remedies to use, some of which are more complicated and less economical than others; but we have a remedy for nearly every season of the year.

THE COLD WATER CURE.

Just when the old brown scale commences to secrete the white eggnest, the hind part of the body begins to raise and soon the insect is attached only by this waxy mass and its beak. If then a forceful stream of water is used with full hydrant pressure behind it, they can successfully be washed off before the eggs hatch. This is the most economical treatment when conducted by municipalities who have control of the hydrants. The expense is about 20 cents per tree. *But it is only successful before the young begin to hatch.*

WINTER TREATMENT.

When the trees are dormant, a spray of about 40 per cent kerosene and water, either in the form of an emulsion, or through a kero-water pump, should be used. Material saving nozzles, like the Vermorel, can be used for this work. It is well to prune the dead wood out before spraying.

"HEADING IN."

When trees are weakened, cut the tops back and then spray the dormant tree with 40 per cent kerosene. They will make a nice top again.

25% KEROSENE.

Shortly before the leaves fall, and before the lice have left the leaves, these can be sprayed with 25% kerosene and burnt by

this spray. They will thus drop prematurely and carry a great many insects down with them.

MIDSUMMER SPRAYING.

After the eggs have hatched and the young have gone on the leaves, we can use a spray of from 7-10% kerosene emulsion, according to the vigor of the tree. This will kill the youngest insects that are hit, but it is very difficult to do thorough work.

Another insect to merit our attention and representing the chewing type of insects is the

WHITE MARKED TUSSOCK MOTH.

This has been rather conspicuous in recent years, especially in Milwaukee, but may be found in many towns and cities in the state.

The stage of this insect which is sufficiently striking to attract the attention of the public are the whitish eggmasses, which are plastered on top of a dirty grayish cocoon, all over the trunks of shade trees in the fall and winter. Elms are specially in favor with this pest, but the caterpillars feed on a great variety of trees.

The life history of this insect is illustrative of that of several moths. It is very similar to that of the dreaded cankerworm of the East, which defoliated thousands of acres of apple orchards in western New York about ten years ago, and brought about a status, where an apple orchard was considered a detriment to a farm and its possession was considered a sufficient reason to ask for a reduction of taxes.

The caterpillars which feed on the foliage are remarkably beautiful, with their pretty red heads, two tufts of hair protruding, clearly and sharply cut, forward like a mustache à la German emperor. A large black tuft of hair extends backward and short white brushes of the same nature cover the yellow striped body. They look like a "jim dandy" coming fresh out of a barber shop. They remind me, with that bright fur and black brush elevated, of a beautiful fourfooted animal, which one encounters sometimes on the roadside on moonlight nights. It looks so cheerful,—but oh! the sad consequences!

The consequences are sad here, for the larvae are voracious feeders. They strip a tree right down. They spin their dirty

white cocoons out of hair and silk in protected places among the bark or on the fences. From these emerge the adult moths. The males are winged and capable to pass from tree to tree, they are of a grayish color, about $\frac{3}{4}$ inch long, the caterpillar being a little more than an inch. The females have no wings and lay the white eggmasses right on top of the cocoon from which they emerge. From these hatch the little caterpillars again. I think we have only one brood in this state.

While this insect is very injurious, it is a comparatively easy one to deal with. The fact that the female has no wings enables us to prevent from laying eggs in the tree by putting a fluffy cotton band around the trunk. However we must first clean the tree of those insects that are there already. This can be done during the winter by picking off the egg masses or by spraying with $\frac{1}{4}$ of Paris green to the fifty gallon barrel of water, while the caterpillars are feeding.

It is well to consider here a newcomer among Wisconsin insects, so that we can be on the lookout. I have observed a slight touch of its work in the southern part of the state.

THE IMPORTED ELM LEAF BEETLE.

This beetle is a close relative of the potato beetle, the asparagus beetle, the striped cucumber beetle, and similar insects which occupy a very prominent place in the Rogues' Gallery of insect criminals.

It looks very much like the striped cucumber beetle. It is about $\frac{1}{4}$ inch long. The orange colored eggs are deposited in clusters from 5 to 25 on the underside of the leaf. The larvae is yellowish to brown, with many dark colored hairs.

The beetles feed on the young leaves in the spring, eating holes into them. The larvae feed mostly on the underside of the leaves, chewing off the tender underside and leaving the hard veins.

The insects seem to manifest in some sections a preference for one kind of elm to the other. In some sections the American elm suffers the more, in some the English.

REMEDIES.

Spraying with arsenate of lead has proved to be the most successful remedy for poisoning the foliage. This insecticide

sticks better than Paris green. There should be one spraying to catch the beetles when the leaves are developing, and at least one later on when the young larvae hatch. If the insect is noticed, apply to the Experiment Station for definite instructions.

Most leaf eating pests can be handled by poison sprays after the pattern of the Tussock moth larvae. Of scale insects, few are here in Wisconsin injurious enough to be called serious pests on shade trees. Yet there are a few which may require treatment.

The Elmbark Louse (*Chionaspis Americana*) is very bad on some trees in Milwaukee and some towns in the southern part of the state.

The Oyster Shell Barklouse (*Mytilaysis pomorum*) injures frequently mountain ash, flowering crabs, and other trees considerably.

The Scurfy Apple Scale infest apple trees and may be found on native thorns.

The San Jose Scale attacks a great number of shade trees and shrubs, if given a chance.

All of these are best treated during the dormant season by spraying with diluted kerosene, or with the lime and sulphur wash.

If you have any kind of scale on your trees, send them to the Experiment Station.

It would lead us too far to take up the subject of borers, but I want to say this: The expense of spraying large trees is not as considerable as is generally believed. The first outfit is expensive, but every up-to-date town or city should procure one. A 4-5 horse power gasoline or steam engine and pump, with hose, wagon and all incidentals, costs about \$500. The spraying of trees will run from 10 to 50 cents according to material, management and size of trees. Most citizens will gladly pay for it, if they have the assurance of good reliable work.

Co-operation is success in civic improvements.

DISCUSSION.

Mr. W. J. Moyle: What will we do with large trees that are badly infested and have become weakened?

Mr. Bues: If you have such trees that have become weakened I would cut them back severely and in addition to that I would spray them with kerosene emulsion. Do not do the cutting without spraying, it would only make them worse. If those trees were badly affected I would cut out the dead wood, the unnecessary wood, the wood that the tree did not need anyway, and then I would spray them during the winter with kerosene emulsion. Otherwise let them go until the first week in May, when the white masses begin to show, when the young commence to hatch, then spray them with water from a hydrant or from a fire plug which will give force.

Mr. Moyle: There is an insect we find on our cottonwood, weeping willows and Carolina poplar. We are planting trees but the insects are eating them right off.

Mr. Bues: It is the imported willow beetle, so-called, and is shipped to this state in nursery stock from New York and Ohio so far as I know. Every case where this insect has been found that has come under my observation I have traced to those two states. New York is badly infested because proper attention was not given the matter, but it should be barred out of this state. We should put it on the blacklist. You can't do anything with it except to dig it out with a knife. My habit has been to go through the nursery and if I find a tree more or less damaged I simply break it right off where the injury exists.

Mr. Geo. J. Kellogg: Does the tree ever recover? Thirty years ago at Janesville we had the cotton louse, but all the trees except a few recovered. What was said about a parasite?

Mr. Bues: Prof. Forbes of the Illinois Experiment Station, wrote a little pamphlet on "Insect Cycles," and he found upon investigation that this cotton maple scale has regular periods of from eight to ten years in which it makes visitations, and the period of visitation usually lasts three or four years, and then for four or five years there is a period of immunity. Just a word in regard to this parasite. The point in question is this, if this parasite breeds only on this particular plant it will soon cut off its own food supply on the plant and the parasite will

die out, and then it takes a number of years to bring it back again. The opinion has been that the parasite will kill out the scale in a few years, but that is not true. Upon that basis people who leave it to the parasite would have the condition that confronts us now. I think as I look at it that there is a certain relationship between the amount of precipitation and the appearance of this insect, because in wet seasons we have had more trouble.

Mr. Geo. J. Kellogg: If cities can spray with water why would it not answer in the country?

Mr. Bues: There were but few cases that came under my observation in the country where the trees were infested. If it was found in a small town which had no water pressure I would use the fire engine and hose. In the country the only thing to do is to spray with a regular spray of kerosene emulsion, and spray in the winter, and if the trees are too badly affected you have to cut them back and then spray. The trouble is mostly in the cities and larger towns, and you find it sometimes on the farms around the towns. Any community that will plant its maples close together will get it.

Mr. Geo. J. Kellogg: Why not cut out the soft maples and save the elms?

Mr. Bues: I honor that recommendation. I say let the maples die and plant more elms. We are all satisfied that the elm is better, but if you take a place where nearly all the trees are maples and you take them all out you will have a treeless town.

The President: I have noticed sometimes where there are two or three maples sometimes only one is infested.

Mr. Bues: That was just the beginning of the infestation. The young had hatched and were probably moving in the tree. If the trees are planted only fifteen or twenty feet apart there is nothing to hinder their progress.

Mr. Root: I found in Milwaukee on Fourteenth street and also on Grand avenue that the elms were infested by an insect which I should judge was very much similar to the cotton moth. Every tree was covered with a dark brown mass of cocoons, and I should think the body of the tree contained perhaps a hundred of those cocoons.

Mr. Bues: That was the second insect described, the white spotted tussock moth.

Mr. Root: Is that the insect working in Milwaukee?

Mr. Bues: Milwaukee is full of it. You should go to work and pick off those cocoons and then adopt the spraying process, but these two must go together.

AFTERNOON SESSION.

HARDY HERBACEOUS PERENNIALS.

JOHN TIPLADY, Lake Geneva.

My subject for today is the Hardy Herbaceous Perennials, a class of plants that are yearly gaining favor with the flower-loving American public.

Pardon me if I dwell occasionally on the paeonia, phlox, columbine, or any of the plants about which other gentlemen will address you later on, or advance any theory with reference to perennials of the wild.

The successful cultivator of the hardy perennial will first bear in mind that the soil must be well prepared by incorporating a liberal supply of manure making sure that the drainage is perfect.

If a veranda porch is first to be planted it must be planted with a perennial climber. Only in exceptional cases must we use an annual, which is such a bother to train on strings and finally tear down in the fall. If the location is permanent, then plant a permanent vine, that you may enjoy each year until the very height of its beauty has been realized. Who can imagine a more gratifying sight than a beautiful clematis in full bloom, stretching its flowery existence across your veranda, affording healthful shade to the owner. Several worthy clematis are now on the market. *Montana grandiflora* blooms in May, *coccinea* in June, *Jackmanii* in July, and *paniculata* in September. *Jackmanii*, the universal favorite, has not been superseded by any variety of that color and habit, improving in splendor as it advances in years, and like civilization, annually reaching out for newer fields to cover, and the same may be said of

paniculata, recognized as the choicest and most satisfactory climber up to date. When well grown it always pleases the most fastidious lover of nature.

Another good climber is the purple wisteria. In Central Park, New York, it is used almost exclusively for covering rustic arbors, and during May and early June they are a veritable mass of purple. The secret of success is in the pruning. Cut them back as you would a grape vine or a red-currant.

For covering a brick building use *ampelopsis Englemanni*, whose tendrils resemble the foot of a tree toad, clinging to the smoothest surface. *Ampelopsis quinquefolia* has to be supported by wire, or whilst loaded with moisture or struck by a gale it will sometimes get loose and fall to the ground a twisted mass of vegetation. *Veitchii* is not hardy and cannot be relied upon.

It is pleasing to look at a perennial garden and to notice the diversity of fragrance and color. There is no class of ornamental plants that can equal the hardy herbaceous perennial in popular favor nor in merit. Some of them continue to bloom for weeks or months while others are only on display for a short time but they make up for it by the beauty of the blossoms they produce.

Perennials can be secured in every gradation of size and color, and with a little care in selecting varieties a constant succession of bloom can be maintained through the entire summer.

People are beginning to realize that it is better to plant perennials which come up year after year, than to bother with annuals altogether. But do not think that I am relegating the annual into the backwoods of oblivion—not much. They have a duty to perform in every garden and we will always have our sweet peas, and asters in endless variety, marigolds and zinnas to keep grandmother's patch fresh in our minds—snapdragon, cornflowers, mignonette and cosmos. But we want to encourage the hardy herbaceous perennial. When there is an attempt to say which perennial is the best, there will probably be a dozen named by people as their favorites, and there would be reasonableness in the arguments in favor of each. For instance, the beautiful columbine, whose champions have organized a columbine society, the paeonia, whose champions have organized a paeonia society, some one would plead the golden rod, common but beautiful—our national flower—we would also hear from the

Funkia, hemerocallis, coreopsis delphinium, phlox, larkspur, Dahlia and gladiolus many of which are indispensable, and in fact have a popularity that puts them in a class by themselves. The value of the perennial phlox for instance lies in its fragrance, diversity of color, and long blooming period. The iris, whose very name signifies "rainbow," has a wonderfully delicate range and combination of color. Both of these plants will be duly discussed at this meeting by gentlemen who have papers prepared on the subject.

The rose colored spikes of lythrum when seen growing to perfection, the tips of its rosy colored spikes reaching 6-7 feet high, blooming as it does through June, July and August, presents a very satisfactory appearance when planted among shrubbery in clumps or blended with the yellow flowers of heliopsis or hemerocallis, bordered with that persistent flowering perennial, Achillea roseum (the pink variety of Milfoil.) But keep the blue away from this combination or there will be discord. In planting for effect allow a clump of shrubbery or a building of some kind to break the view before planting your blue delphiniums, aconite, platycodons or forget-me-nots. For yellow effect we have the different varieties of helianthus, heliopsis, heleniums and Rudbeckias, all tall growing plants, with hemerocallis or anthemis tinctora for a border. By this list you would naturally infer that all yellow perennials commence with H, but they don't.

For a pink and white effect in some desirable nook or corner, what is more pleasure than a group of herbaceous spirea with that stately variety aruncus with its tall pampas-like plumes for a background against the shrubbery—in front of this spirea Chinensis, a distinct and handsome species with its handsome white flowers, a little dwarfer in habit than the preceding one—bordered with that valuable little double variety filipendula fl. pl. with a clump located at one end and near the back of crimson meadow sweet, your combination is complete (pink and white).

If a red effect is desired at some distant point of view plant monarda didyma (known as bee balm—Oswego tea). Horse mint must be valuable, but this must be limited in size as the color is intense. Another plant worthy of cultivation is the Boltonia, a tall growing plant with pink and white aster-like blossoms produced in profusion during August and September.



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Another perennial strikes me as indispensable in table decorations, and that is the *gypsophilum paniculata*. Its breath-like blossoms when artistically arranged with other small flowers, gives a light airy effect so essential in the arrangement of center pieces or vases for the sitting room.

Another class of plants prized and admired by all is the *dianthus* or hardy garden pink, which give a profusion of sweet clove-scented flowers, beautiful in their simplicity and very easy to raise either from seed or cuttings taken during late summer. The *campanulas*, too, must not be forgotten. Ordinary good garden soil will suit these charming plants, easy to grow and useful for cutting. They are in size from 1 to 5 feet and the range of colors is white, pink, purple, blue and intermediate shades.

The following are dwarf, low growing kinds: *C. carpatica*, blue and white; *Garjanica*, blue and white eye, and *glomerata*, blue or mauve, 1 foot high.

The best of the fall varieties are *persicifolia*, *latifolia*, *macrantha*, *pyramidalis* and the double varieties *Moorheimi* and *Backhousii*. All perennial varieties are easily increased by division of the root but the biennials (*campanula media* or Canterbury bell) must be raised each year from seed sown in June or July, pricked off into their permanent position and protected for winter. All *campanulas* are extremely beautiful, easy to grow, and should be in every garden. I must not close without saying a good word in favor of the *anemone* in its many varieties, *pulsatilla* and *Eliza Follman* for early, with *Japonica* and its variety for late. Whirlwind and queen Charlotte—plant spring and fall.

If any one is interested in perennial growing and cannot afford, or does not care to procure the above named, he can satisfy his desire by collecting native species all of which bear a close resemblance to the cultivated kinds. By following up this kind of gardening and studying the needs of each particular species, he may in a few years become an expert and make a very creditable showing, comparing favorably with the cultivated article. He can collect and cultivate the columbine *Canadense*, and for iris grow the wild blue flag (*Iris versicolor* and *prismatica*). For lilies he may collect *lilium superbum* and *Canadense*, both native of Wisconsin. For a *campanula* he may collect the harebell (*campanula rotundifolia*), the blue bells of

Scotland, the flower famed in song and story. For a climber he can dig from the wild woods *ampelopsis quinquefolia* (the virginia creeper) and *clematis Virginiana*. His shrubbery may be composed of the different varieties of native dogwood (*cornus paniculata* and *stolonifera*), honeysuckle (*Lonicera Sullivanti*), wild gooseberry, witch hazel, prickly ash, flowering thorn and currant, with a ground cover of wild geranium, rue and strawberry.

For phlox he can use the moss pink, and if he cannot afford *Monarda didyma* he can collect *Monarda fistulosa*. For clumping among the shrubbery and for planting in distant nooks and corners he can collect a wild perennial of almost any height or color he may desire, from the tall growing Joe pye, that beautiful purple eupatorium which sometimes grows 10 feet high, away down in gradation until he strikes the vinca, nepeta and moneywort, but a few inches in height. Nature has bestowed on Wisconsin a wonderful range of native perennials.

In a tamarack swamp near Lake Geneva, that beautiful terrestrial orchid *cyrtopodium spectabile*, attains perfection par excellence. Not a year passes but I visit that spot and pick an armful of these magnificent flowers. In the adjoining slough we often find the little calipogon, and later in the year the ground is tinted with the blue of the gentian—an intense blue—bluer than the bluest sky. Thus we have reviewed a few points of comparison between the cultivated and the wild.

DISCUSSION.

Mr. Cranefield: Would an amateur succeed in getting a good supply of herbaceous perennials from seed?

Mr. Tiplady: I have been very successful in the propagation of most perennials from seed. As a rule you cannot buy double flowered campanula; they do not produce seed, but they must be divided at the root in order to succeed.

Mrs. Sperbeck: I would like to know how to fix cold frames in this part of Wisconsin to winter pansies.

Mr. Tiplady: The pansy is a perennial. To get the best results with pansies, after buying the best seed you can procure, it should be sown in July or August, put in a cold frame and

protected in winter, then plant in a prominent position next spring. Pansies from spring sowing are not satisfactory, but to insure a profusion of beautiful flowers the seed should be sown in July or August and wintered over.

Mrs. Sperbeck: I have never had success with Canterbury bells, and I would like to know how they should be treated.

Mr. Tiplady: I give Canterbury bells the same treatment at about this time or September, except that Canterbury bells ought to be planted in a less prominent position. Remove them in the spring and plant where desired and you will have an abundance of flowers.

PHLOX.

F. II. DRAKE, Madison.

There is scarcely a flower garden of any pretensions that does not contain flowers from the four quarters of the globe. Our common garden and house plants are collected from the world at large. Flowers from Australia and the Indies blossom side by side with plants from Iceland and Siberia. Even in the hardy gardens of this north temperate zone, we have acclimated natives of southern Europe, Africa and the Orient. In the front rank of favorites with the roses and paeonies stands America's representative, the Phlox family. They combine three of the prime requisites of a hardy garden plant; hardiness, profusion of bloom and neatness of foliage. The period of bloom of the three or four species most commonly cultivated extends from May until frost. Their ease of culture and vigorous growth, together with their freedom from insect enemies and disease, make them popular with every lover of flowers.

This genus was classified by Linnaeus, "the father of botany," probably in the latter part of the 18th century. He gave it the name of phlox from the Greek $\Phi\lambda\omicron\varsigma$ (flame), the ancient name of a brilliant variety of Lichnis, which he transferred to this distant American relative. One authority claims that the name was given on account of the shape of the flower bud and its fancied resemblance to a flame.

The variability of certain species has given rise to much con-

fusion of specific names by the writers and the trade of the last century. Thomas Nuttall listed 17 species in 1818, Don described 38 in 1838, while Professor L. H. Bailey, in the Horticultural Encyclopedia, says "about 30 species."

The Phlox family are all perennial herbs, with one important exception, the annual, *P. Drummondii*. There is one Chilean species; the rest are all North American, although the *P. Sibirica* is also found in Asiatic Russia.

THE HARDY PHLOX.

When we speak of "phlox," without using a common or specific name, we generally have in mind that group of tall hardy perennials, whose profusion of bloom is the glory of the late summer garden. This large horticultural group, comprising hundreds of varieties, stands in great need of a common or garden name. Its origin, though somewhat obscure, is traced to two or more species, so that any specific name is not available. One writer will refer to the whole group as *P. paniculata*, and another will call it *P. decussata*; recent writers have divided the group into two sections, the early or *suffruticosa* and the late or *decussata*.

The wild flower *P. paniculata* is a native of Pennsylvania and south, ranging west to Illinois. It is common in the woods, blooming in July and August; erect 2 to 4 feet tall. The flowers, borne in terminal panicles, are of a pinkish-purple, varying to white. This and in a lesser degree, the *P. maculata*, a plant of similar range and habit, are generally considered to be the parents of this group, which I will refer to hereafter as the "*Hardy Phlox*." To what extent other species have been used in the development of the cultivated varieties does not appear. The close relationship of the different species would seem to make crossing possible with many of them; it is even hinted that brilliant colors have been produced by crossing with the annual.

EARLY HISTORY OF CULTIVATION.

Although the hardy phlox is classed as an old-fashioned flower, it is of comparatively recent origin. Don's Gardener's Dictionary, published in 1838, asserts that *P. paniculata* was in cultivation in 1732 and *P. maculata* in 1740; but I can find no evidence that the development of the present garden varieties



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Perennial Phlox, in a Madison Garden.

was begun before the 19th century. A list published by Joseph Breck in the *Horticulturist* in 1847, enumerates about 20 varieties, including *P. paniculata* and *P. maculata* and others bearing the names of contemporaneous American and English gardeners. The colors described at that time covered nearly the same range as those now in cultivation; but they evidently were not generally planted in the gardens of this country, as the white and purple varieties were the only ones commonly cultivated in the gardens of a generation ago.

LATER IMPROVEMENTS IN THE CULTIVATED VARIETIES.

There have been great improvements in the hardy phlox in the last 50 or 60 years; the varieties now numbered by hundreds include the tall and the dwarf. The period of bloom has been lengthened from a few weeks in mid-summer to a period extending from June until frost. While the colors of many of the varieties cultivated today originated years ago, there has been a marked change in the increased size of the florets, and the size and shape of the trusses; differences in height and period of bloom have added to the number.

The phlox colors belong to the cyanic series, and from the pinkish-purple and white of the native flowers have been evolved a wonderful range of colors and combinations; from the white through many shades of pink to brilliant red, and from lilac and rosy mauve to dark crimson. The yellow and orange have been considered impossible in this series; a light buff and an orange red are the nearest approach to these colors yet obtained. Many of the handsomest varieties have a distinct "eye" in the center of crimson or carmine. There are some with petals delicately shaded with pink or rose, and a few with blotched or striped petals. Two varieties are offered with variegated foliage. The English gardeners were naturally the first to take up the development of this flower, and that it still occupies a prominent place in European horticulture is evidenced by the recent large importations, including a hundred or more varieties selected from the gardens of France, Germany, Holland and England. The recent growth of interest in floral and landscape gardening has created a demand for new and beautiful varieties, to which the trade has responded with long and carefully selected lists.

A FLOWER FOR THE AMATEUR GARDENER.

The amateur gardener of limited means, who invests in a few varieties of hardy phlox, will find that he has made an investment that will yield him most satisfactory dividends. He will have no hopeless war against insects and disease, and no complex problems of culture and propagation to distress him. Good nursery stock planted in the fall will produce handsome blossoms the following year. The second year will show a marked increase in the number of blossoming shoots, and in three or four years the original plant will have grown into a handsome clump which may remain undisturbed for years. If one has space to plant, he can increase the stock of his favorite varieties, beginning propagation the first season. In a very short time he will be able to plant in masses to his heart's content, or to the limits of his available space.

THE CULTURE OF HARDY PHLOX.

Phlox is perfectly hardy in this climate. Old clumps of the old fashioned purple and white, often seen around old homesteads, known to have been planted a half century ago, and having had little or no care in the last thirty years, have continued to bloom regularly every year. While hardy phlox belongs to the "can't be killed" class of perennials, culture should not be neglected. It's ready response to good care and cultivation will amply repay any amount of trouble expended. Phlox should be planted in good rich soil, worked a foot or more deep. The roots do not extend more than six inches below the surface, but the deep preparation of the soil helps to retain the moisture which will rise by capillary attraction to within reach of the roots. In the fall, after the killing frosts, the tops should be cut and a light sprinkling of coal ashes applied to discourage slugs and other lurking insects. A light covering of manure or marsh hay is very beneficial, especially if the ground has been tilled and kept free from grass and weeds. The ground should be forked up in the spring, or better, manure forked in, and a mulch applied during the hot summer months. Water plentifully up to and during the blooming season. Old clumps should be taken up and divided every three or four years to prevent them from becoming root bound. Division and transplanting can be done in the early spring, though the best results are ob-

tained from fall planting. Plants should be set $2\frac{1}{2}$ or 3 feet apart each way, taking care that the taller and more vigorous growing plants do not overtop and shut out those of dwarfer habit. If our nurserymen would give more accurate descriptions of the habit of the different varieties it would make planting and planning easier for the average amateur.

Phlox is said to come into full floriferousness in the third or fourth year of it's growth, when it becomes a large and vigorous clump with a hundred or more flowering stems. The largest clusters of flowers are, however, obtained on the younger plants. Many of the earlier blooming varieties will bloom again later in the season if they are cut down after the first period of bloom.

The hardy phloxes are especially valuable in landscape work, as they will thrive in the shade or the open and in any exposure. Planted in masses or in the borders, their brilliant pinks, carmines and crimsons round out the summer with a luxuriant display, and strike a harmonious chord with the prevailing yellow and gold of the autumn flowers.

A FLOWER EASILY PROPAGATED.

There are no deep secrets in the propagation of phlox. They are easily propagated by division or by cuttings, and in this way only are the different varieties perpetuated. Seedlings do not come true, having a strong tendency to vary and revert to the original type. While new varieties are produced from seed, the great majority of seedlings are apt to be inferior to the parent stock; even with the most careful artificial cross fertilization, there are many failures to record for every desirable variety produced. If the self-sown seedlings are allowed to grow up about the original plant, they will eventually crowd it out and the result will be a mass of undesirable colors; nondescript purples and eye offending magentas.

The natural growth of a clump of phlox is accomplished in two different ways. At the base of each upright stem, from one to several eyes or underground buds are produced during the summer. From these eyes spring the new shoots the following season, each shoot repeating the process in turn, until by crowding and lack of nourishment, the limit of the size of the clump is reached. Any or all of these shoots may be separated from the parent plant in the early autumn and transplanted,

cutting the stem down to six inches or a foot in height. It is not until the plant is several years old that offsets are produced. These are underground root-like stems which come to the surface with an upright leafy stem, send forth their own roots and eventually separate from the original plant. Nursery stock is generally grown from cuttings, as a greater number can be produced in this way and they are of a more uniform size and quality. There is also less danger of stray seedlings being taken by mistake for offsets. Cuttings are taken for this purpose in the early spring from the vigorous young shoots. They root readily in sand or sandy soil, requiring only moisture and partial protection from the sun. The amateur should have no trouble in making them grow in the ordinary garden soil. These "spring struck" plants will generally bloom the first season a week or so later than the older plants. Branches may be broken off from the lower part of the trusses in early summer and treated like cuttings. The leaves of all cuttings should be reduced about two thirds to prevent too rapid evaporation.

A FEW OF THE BEST VARIETIES.

The varieties offered by the trade are much too numerous to mention; the names of a few years ago do not appear in the lists of today; but lest we forget our popular favorites when we read the attractive catalogues of a few years hence, a few of the most valuable and distinctive varieties should be recorded.

Athis, salmon pink, with crimson eye; an old variety with small florets, but the brightest and best of the color. This is often described as the tallest of all the phloxes, growing five feet tall with good cultivation. It is a vigorous grower, with strong stems, increasing rapidly, late.

Puritan, tall white, late flowering. A vigorous growing variety with immense branching panicles. It is grown by florists here who consider it very valuable for cutting.

Miss Lingard (Described by J. W. Elliot), "This belongs to the earlier or *suffruticosa* section of the phloxes. Established plants bloom in June and are about done when the late phloxes begin to bloom. Spring propagated plants do not bloom before August or often much later. We often have great beds of them after the late phlox have disappeared. The flowers are white with a delicate pink eye, which soon disappears. The panicles



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are one to two feet long, which makes it one of the best phloxes for cutting and it is grown by the florists here (Pennsylvania) for that purpose. The plant is a very strong grower, far more vigorous than any of the late sorts and when planted permanently should be set at least three feet apart. The foliage is large and glossy. Height three to four feet."

Arthur B. Starr, a bright purple variety put on the market this year, blooming at the same time, is said to be a hybrid of the *Miss Lingard*.

Le Mahdi, a very distinct and striking purple shade, varying with the light; sometimes a dark steely blue and again a rich glowing purple. A vigorous grower, about two to two and a half feet tall.

Ferdinand Cortez, a fine coppery red with extra large trusses; dwarf. A specimen in my garden, planted last fall, bore a truss nearly a foot across which was twice covered with florets.

Aquillon, a late bloomer, about one and a half to two feet tall. A distinct and attractive sort; white, delicately shaded to pink and carmine in center. A vigorous, strong stemmed variety.

Richard Wallace, one of the old favorites of the many varieties with colored eyes. White with distinct eye of carmine tinged with violet; early of semi-dwarf habit.

Splendens, crimson, one of the darkest colored. The flowers are rather small forming regular globe shaped panicles. Tall, strong stems, of rather slow growth.

*Coquelicot*¹, one of the brightest reds yet produced. Sometimes described as an orange red or a near approach to scarlet, but a vermillion red is perhaps more accurate. There is a tinge of purple showing in the center. The stems of this variety are more slender than others of the late sorts, seldom growing more than one and a half feet tall but the plant increases in diameter more rapidly than the tall growing sorts. It would no doubt be an advantage to thin out the shoots in early spring. It is very effective as a bedding plant.

THE CREEPING PHLOX.

P. subulata, the moss pink or ground pink of the old fashioned garden, is a most distinct type of phlox, in appearance very unlike any of the other species. The leaves greatly reduced and crowded on the creeping stems, give the plant a mosslike

look that gave rise to the common name. It is valuable from a horticultural point of view, and has been in cultivation since 1786. It is a native of New York, west and south, growing on dry rocky hill-sides and sandy banks; the short flower shoots ascending from creeping and tufted stems. The native flowers are pinkish-purple or rose color, varying to white, blooming in April and May. It is becoming very important in landscape work, as it colonizes very readily, increasing rapidly and forming a dense mat of neat evergreen foliage. The blossoms, borne in few flowered cymes, are so profuse as to completely conceal the foliage. There are many colors now offered by the trade; rose pink, white, light blue, purple and some with pink or white eyes, crimson blotches, etc. *P. subulata* is entirely hardy and will thrive in almost any soil, provided it does not have too much water.

OTHER SPECIES OF PERENNIAL PHLOX.

The following species are often classed with the creeping phloxes by the trade. The flowers are borne in terminal cymes; stems ascending from $\frac{1}{2}$ to 2 feet from a more or less decumbent base. *P. ovata* or *Carolina*, and *P. glaberrima*, are two very similar species, ranging from Virginia and the south, to Michigan and Wisconsin. *P. Carolina* is reported as comparatively rare in the central states, but more common in the mountains of the south. The native flowers are a pinkish-purple. *P. Carolina* is offered by a prominent Pennsylvania nursery as the brightest blue flower in the phlox family. It blooms in June and July.

P. amoena, is another species offered by the trade. It is a native of Virginia, Kentucky and the south. Flowers purple, pink or white, born profusely on stems 6 inches high.

The *P. pilosa*, Linn. (*P. aristata*, Michx.) probably has the widest range of any of this group. It is found in dry woods and prairies from British America to Florida and Texas and east to New Jersey. The flowers are numerous, varying through pink and purple to white. I do not find it offered by the trade although it is recorded as having been in cultivation in 1759.

P. reptans is a native of Pennsylvania and the southern states, west to Kentucky. It grows 4 to 8 inches high with showy reddish-purple flowers—in cultivation since 1800. It is found in

the mountains of Pennsylvania where it is exposed to a temperature of 30° below zero, and should be hardy in Wisconsin. A variety described as deep rose color is offered by the trade.

P. divaricata, Linn. (*P. Canadensis*, Sweet) is perhaps the best known of this group. It ranges from New York to Michigan and Wisconsin, and north to Canada. The flowers are borne on slender stems 10 to 18 inches high; blue or pinkish-blue, sweet-scented and showy. It often colors the fields and borders the railroad tracks with its attractive flowers in May and early June. It is fine for naturalizing and prefers a rich soil. It has been in cultivation since 1825. It is offered by the trade in a soft light blue, and a white variety, *P. divaricata Alba*, has recently been put upon the market. This species has generally been called the Wild Sweet William, although Gray gives this common name to the *P. maculata*.

P. stellaria is a comparatively new species found in Kentucky and southern Illinois. It has a pale blue or silver gray blossom, growing about 4 inches high. This is now being cultivated by some of the eastern nurseries.

This interesting group of phlox will, no doubt, assume a much more prominent place in horticulture in the next few years. The variability of the flowers and the close relationship of the different species offers a great opportunity to the horticulturist who will, using the methods of the "Wizard" Burbank, develop new varieties and brilliant colors.

THE ANNUAL PHLOX.

P. Drummondii, the only annual of the family, is described as erect, branching, 6 to 8 inches tall; the flowers showy, borne in broad, flat topped cymes. This is a native of Texas, where it was collected by Drummond in 1835, and sent by him to Sir William Jackson Hooker, an eminent London botanist, who named it in Mr. Drummond's honor. Hooker describes the color as "pale purple without, within, or on the upper side, of a brilliant rose red or purple tinge, the eye generally of an exceedingly deep crimson." Lindley, who described it in the Botanical Register in 1837, said the flowers are "either light or deep carmine on the inner surface of their corolla, and a pale blush on the outside, which sets off wonderfully the general effect. A bed of this plant has hardly yet been seen, for it

is far too precious and uncommon to be possessed by anyone, except in small quantities; but I have had such a bed described to me, and I can readily believe that it produced all the brilliancy that my informant represented."

P. Drummondii soon sprang into prominence as a popular and valuable garden annual. The colors have varied to many shades; showing a wider range than has been produced in the perennial species. A scarlet, a deep maroon or garnet and a light buff are colors that I do not think have been seen in any of the perennials. A number of double and semi-double varieties have been offered by the seedsmen; but the free-flowering single varieties continue to be the most popular for bedding and general use. The *Quedlinburg* or *Star Phlox* is a horticultural variety of *P. Drummondii* that is very interesting and attractive; the petals are deeply indented, forming star shaped flowers.

P. Drummondii is of the easiest culture; requiring only a warm sunny place. It will thrive and bloom until mid-summer in a poor soil; but if planted in rich soil and given good care it will continue to bloom until fall. It is one of the earliest annuals to come into bloom and is usually planted in the open. It may be planted in-doors or in the hot-bed, but if one wants strong plants with stems of sufficient strength to hold up the large clusters of flowers, they should be transplanted just as soon as they are large enough to handle, setting the plants about 8 inches apart. The volunteer seedlings can be transplanted in the spring and will often bloom earlier than those planted in the seed bed, and a few stray plants allowed to grow up in the beds and borders make bright spots of color in unexpected places.

As to insect enemies and disease, the phlox seems to be practically free from them. There is a phlox worm, the larva of a moth (*Heliothis phlogophagus*) very similar to the boll worm moth that has made so much trouble in the cotton fields. I can find no record of its having appeared in this part of the country and do not think there is any danger of its ever becoming a serious pest. The stem borers that attack almost every herbaceous plant in the garden, rarely are found in the woody stems of the phlox, as the hollow and pithy stemmed plants are their natural hosts.

The foliage is always neat and free from rust and blight.

DISCUSSION.

Mr. Cranefield: I would like to ask whether it is practicable in order to retard the period of bloom to cut off the top before the buds are set.

Mr. Tiplady: You can do that, but you get an inferior blossom. You encourage the lateral growth which is inferior to the terminal bud.

Mr. Geo. J. Kellogg: Did I understand you to say that the *Drummondii* would not come true from seed?

Mr. Drake: The seed I buy comes very true to color. They must be raised separately and kept separate, but I have had no trouble whatever with odd colors coming in the *Drummondii*. It is very seldom that a new valuable variety is originated. I could not say how many hundred, but nearly every nurseryman has a list of from 25 to 100, and you seldom see the same name in two catalogues.

Mr. Geo. J. Kellogg: Do you recognize the best white that is on the table here (indicating)?

Mr. Drake: It is one, the name of which I am in doubt. I am told it was the Puritan, but I am not sure.

Mr. Jos. Reek: What kind of soil do you recommend for *Phlox Drummondii*?

Mr. Drake: It would grow on almost any soil. The soil should be well drained, at least so it will not bake in the hot summer months, and if they are watered during the hot summer months they will bloom until frost, otherwise they die down the middle of August.

Mr. Reek: Can the blooming be improved by mulching during a dry summer?

Mr. Drake: I think it might.

Mr. Tiplady: Treatment of that kind is advisable for all plants that grow.

DELPHINIUM AND AQUILEGIA OR LARKSPUR AND COLUMBINE.

ALFRED MEIER, Madison.

These are two of our old fashioned and hardy perennials. They belong to the Crowfoot family. In the wild state, they are worthy of much praise, but under the influence of culture they have both developed until they rank high as standard hardy perennials for grouping or for the hardy border. Being very hardy they will withstand our severe climate well and when once well established will withstand weeds and grass which is especially true of delphinium, and so can be well recommended for the farmer's garden or lawn.

Fine clumps of larkspur may often be seen growing in the lawn apparently in the sod but of course they cannot be expected to compete with those which have received the best of care and treatment. They appear best in groups or singly in the hardy border.

DELPHINIUM OR LARKSPUR.

Delphinium derives its name from the Greek, a Dolphin, as the flower resembles the fish of that name. There are about sixty species in the north temperate zone. We have three species native to this country:

D. exaltatum, or tall larkspur, two to five feet high, and is a purplish blue; it flowers in July and is found in the borders of woods.

D. tricornis, or dwarf larkspur six inches to three feet high, bright blue, sometimes white, and flowering in April and May; root a tuberous cluster; found in the northern states; much used and best for rock work; in midsummer it will die down and appear as though dead.

D. azureum, one to two feet high, sky blue or whitish, flowering in May and June; these are often used in cultivation, especially in the wild garden; it is found from Wisconsin to the Dakotas and south.

There are many other varieties in cultivation derived from various sources and ranging in color from pure white and a



Perennial Larkspur. The specimens in the foreground are of a double flowered variety.



Herbaceous perennial borders.

beautiful lavender up through every shade of blue to deep indigo and purple, and several shades being blended in some varieties.

There is also a variety *Zalil*, introduced from Persia, which has beautiful large yellow sulphur blossoms; it flowers in June and July.

The principal species in cultivation are:

D. formosum, derived from Asia Minor; flowers blue with indigo margins; flowers in June and July; very popular especially for groups; growing from two to five feet high. This species is the foundation for many of the beautiful varieties now in cultivation. It has been used for seed parent for cross fertilization with other species, producing some of the finest Hybrids.

D. Hybridum, also stands high on the list; flowers blue, white bearded; flowers in June and August; origin in mountains of Asia.

D. grandiflorum, two to three feet high; flowers large, blue varying to white with often blue and yellow on the same flower; flowers in July and August; origin Siberia.

D. Chinense, is a variety of *D. grandiflorum*; originated in China; very popular garden form; both single and double flowers, the double known as Breckii.

There are many other species too numerous to mention in such a short paper. These species are again divided into many varieties of which our principal growers have their favorites and own introductions.

PROPAGATION.

They are propagated in three different ways by root division, by cutting and by seed.

First—By root division in fall or spring; cut down plant in July or August, then they break up freely from the roots. By careful division a number of off-sets can be obtained; potted in small pots in fine light soil, placed in a cold frame and by spring make good plants for planting out.

Second—By cuttings in early spring when growth is three or four inches high or from the second growth which comes after the flower stems are removed; root in a frame, shaded, no bottom heat being required; sprinkle often during dry, hot weather and when rooted treat like seedlings.

Third—By seed sown in greenhouse or hot-bed in March or earlier; the best time to sow the seed is as soon as ripe as it hardens its seed-coat and is then hard to germinate; transplant as soon as large enough and give plenty of room to grow; they can be set out in a permanent position if protected. Plants started in March will flower in the same season.

CULTIVATION.

It thrives in any good garden soil but is improved by a deep, rich, well manured, sandy loam exposed to the sun. Deep preparation of the soil is important. To get the best results they should be lifted every three or four years, the soil well manured and dug deeply, the plants divided and reset, but this is not necessary unless fine flowers are desired, as when once well developed they will withstand much neglect. They should have a dressing of manure every other year. Two good crops in one season may be obtained by cutting away the flower stems as soon as the flowers have faded but no seed will be produced this way as the second crop does not have time to mature. In the fall cover with a few inches of leaves or manure.

AQUILEGIA OR COLUMBINE.

Aquilegia is another well known and popular flower from the same order as Delphinium. There is one species of this found in Wisconsin, the common Columbine of America.

A. Canadensis, well known for its bright scarlet, yellow flowers from April to July. There are some beautiful hybrids from this and the blue species. There are also several other species native to this country:

A. Jonesii, found in Wyoming and Montana.

A. formosa, a variety of *Canadensis*, with brick red and yellow flowers; found west of the Rockies.

A. longissima, a pale yellow flower found in the ravines of southwest Texas into Mexico.

A. chrysantha, a well known and popular variety which differs from the others in its yellow flowers standing erect instead of drooping; found in Mexico and Arizona; flowers from May to August; it is three to four feet high.

There are many other species from Siberia, Japan and Europe, the best known and most popular being the common columbine.



German Iris. From a photograph after the specimens had been in transit for 48 hours, showing that Iris blooms may be shipped.

of Europe (*Vulgaris*); flowers violet. There have been many varieties derived from this both single and double, ranging from pure white to deep blue also variegated and yellow.

PROPAGATION.

Columbine can be propagated by division but best by seed. It is hard to get absolutely pure seed except from wild plants. The various species in cultivation mix or hybridize very easily and are often very inferior to their parent plants. The seed should be sown in pans or cold frames in March or in the open air in April or May. As most of the seed of the columbine are slow in germinating the soil must be kept moist on top until the young plants are started. If in a cold frame they should be shaded with cheese cloth to retain the moisture and yet admit a circulation of air, which will prevent the young seedlings from damping off. When seedlings are large enough pick them out into another frame or set them in their permanent places, but shade them for a few days.

CULTIVATION.

This hardy perennial prefers a light, sandy and moist soil, well drained and exposed to the sun; but many stronger species, when of good size, can be planted, and do well, in heavy garden soil.

THE IRIS FAMILY.

W. J. MOYLE, Union Grove.

The iris has been a popular flower with people from the earliest history. It seems that the Greeks named it after the rainbow on account of its many brilliant hues and colors. And I've not a particle of doubt but what Moses as he lay in his ark of bulrushes on the Nile was surrounded with iris and calla lilies or he would never have been found by Pharaoh's daughters, they being led thither by the beauty of the flowers which ever since the dawn of creation have held such an important part

in beautifying and refining the character of every one whom they come in contact with.

One has to but gaze on a field of three or four acres of German iris when in their full bloom to realize the fact that the Greeks were not so far off after all when they thought they saw all the prismatic colors of the rainbow in this flower for such a field is certainly a remarkable sight.

But to take up this subject and treat the entire genus which comprises about one hundred species would be entirely out of place at this time and furthermore a great many of these varieties are more or less tender and consequently of no value to Wisconsin people.

It shall be my endeavor therefore to mention only those kinds that are of true value to us and suggest methods of cultivation and the place I think they ought to hold in our plantings of hardy herbaceous plants.

My first recollections of the iris date back to the little blue flags as we called them that bordered my mother's flower beds, growing as they did with remarkable thrift in the hard clay soil and among the stones that divided the flower bed from the sod. Here they grew and every spring I looked with delighted eyes for the first bud to open, throwing to the breeze it's velvety indigo blue petals, this to be followed shortly with many more until the border of iris was a blue ribbon that surrounded the bed.

By the botanists this is known as "*Iris Pumila*," meaning dwarf, but with the common people it is called the dwarf blue flag and will always hold a little corner of it's own in every well kept flower garden.

Speaking in general terms, however, when iris are under discussion our thoughts naturally turn to that species known as the German iris and under this head it might be well to say are classified many sorts that do not belong there. However, to save words and confusion we run them all in as German Iris. The fleur de lis, the national flower of France, comes under this head and would space permit much historie material could be introduced that would show what an important part this flower has taken in the making of history.

Until the Japanese Iris came into existence the German Iris held full sway as on account of their extreme hardiness and bright colors they were to be found in most every garden.

I had an occasion at one time to make a careful study of this flower as they were grown by the acre and consequently when I went into business for myself, I procured a goodly supply of the different sorts and set them out as an advertising medium in my nursery, as nothing will attract more attention when in flower, unless it might be the peony, than a block of this flower in bloom.

As a cut flower the iris will never be a success on account of the great delicacy of the bloom, as it will not stand much handling and it is impossible to ship it.

But for bedding or massing on the lawn or for park work it is one of our grandest flowers we have, so striking and beautiful are its colors.

With me the following named sorts are all considered very fine.

Blue Bird: Medium in height, rich indigo blue, the earliest of all in its class; a very large flower and a free bloomer.

Celesti: A tall grower with flowers of the purest celestial blue, a most profuse bloomer and a good grower.

Florentine: Medium in season and growth. Flowers a beautiful porcelain blue. This is the iris of commerce from which is produced the orris root from which is made the violet scented perfume.

Pallida Speciosa: Medium to tall with large plum colored blossoms; good bloomer.

Madam Chereau: One of the prettiest of the group, a tall graceful grower with pearly white blooms that are nicely frilled with violet.

Queen of the May: The nearest approach to red yet reached with this flower being a bright rosy lavender, and on that account a very valuable acquisition.

Sampson is considered the best of the yellow sorts, its only draw back being that the flower stems are so short, the blooms scarcely reaching above the leaves of the plant.

All the above mentioned sorts can be planted together with the best of effects, in fact it is only when we get them thus arranged that we are capable of appreciating the marked contrast of the different sorts.

Of recent years the Japanese iris have been having their innings and it truly is a noble flower. I have found them not perfectly hardy with me, still if planted in low ground

and given a little winter protection they will amply repay any one for the trouble and care required.

While ours are grown as named sorts, at the present time at least the varieties are so mixed up that scarcely any two firms hit them under the same name, so it would hardly be worth while to mention the names here.

DISCUSSION.

Mr. Treleven: What do you propagate from, the seed or the root?

Mr. Moyle: Increase from the root. The German throws out a root like a finger.

Mr. Treleven: What time do you set them?

Mr. Moyle: In the spring.

Mr. Tiplady: I see I differ with Mr. Moyle when it comes to the matter of defining the Japanese Iris. The reason I asked him to mention the Japanese is because we have the "Insh-ambi," "Inwongo" and the "Fu-Shan-Go" and dozens of others. In regard to the propagation of the Japanese Iris, we have fifteen varieties and they are numbered and named, but I don't pay any attention to the names. I find three years is the natural life of the Iris. At the end of three years they must be divided as the center becomes hollow, and in order to give them a new lease of life they must be divided into three or four pieces and transplanted into good rich soil with access to plenty of water. They must be kept very wet for a short period, that is just before they come into bloom. After blooming they must be gradually dried off and the roots allowed to become dormant. They are very hardy in my experience. The best way to protect them is to cover them in between the plants with rotten manure, which will incidentally help the plant along in the spring, then cover the whole with six inches of marsh hay and they will come out all right in the spring. I find them very hardy with that care.

Mr. Moyle: In regard to the life of the Iris, it may be the gentleman is correct, but still at the place where I was employed we had them for fifteen to twenty years, but they died out in the center, but they were just a solid mass of blue and

white and other colors. Unless you give them good protection they will be killed out or freeze out. The practiced gardener will give them care that the nurseryman cannot afford to give. We cannot afford to give them the attention which gardeners give. They are not as hardy as the German Iris.

Mr. Menn: Is the Spanish Iris hardy in Wisconsin?

Mr. Moyle: No, it is not, generally speaking. I know it is planted off and on, but as a rule I don't think it is successful in this part of the country.

Mr. Tiplady: It is exactly the same as the Japanese in that respect. It has different kind of bulbs. It is hardy if the protection is given it which has just been mentioned.

Mr. Moyle: One or two of the bulbous Iris have bloomed in the most beautiful way. The crocus belongs to the Iris family.

Mr. Tiplady: I wish some of the members present would give us the succession of the Iris family, commencing with the first to bloom and going through the list.

Mr. Moyle: Those three families I have mentioned, the early Dwarf and the German, then the Japanese Iris, and those other varieties are intermediate between the season. The Crocus will be the first as soon as the snow is off the ground in the spring. then comes the little Blue Eyes, then comes the German Iris, and that will extend over two weeks, then follows the English.

Mr. Reik: How does the English compare with the German?

Mr. Moyle: They are not like the German, but they are both important in their place.

Mr. Geo. J. Kellogg: Speaking of the Iris as an advertising medium for the nurseryman, forty years ago I bought a whole wagon load and set them out and I could not give them away: it cost me \$25 to dig them up.

PEONIES.

A. J. SMITH, Lake Geneva.

The peony is often spoken of as the rival to the rose—it is true in more ways than one—it rivals it in delicacy of color—in fragrance—in form of flower—in popularity—in hardiness—freedom from pests and diseases, and ease of cultivation, it far surpasses the rose.

Great attention given it by growers throughout Europe and America, hundreds of acres being devoted to the cultivation of the peonies, nearly two thousand varieties, known by name, the formation of a National Society.

The only flowers to have such attention are the Carnation. Chrysanthemum and the Rose.

Several peony shows held this year have attracted much attention from the papers and public.

Peony nomenclature is in a muddle, several different sorts being on the market—under the same name. The American Peony Society is conducting at Cornell University a test of many hundred plants, contributed by different growers, in this country and Europe, to straighten out this confusion of names.

Some of the best varieties:

Festiva maxima, a very large, pure white with the fragrance of a rose, has a few carmine marks in the center; this variety has been on the market for a number of years, and is still considered the best.

Golden Harvest for planting on a private lawn, one without a peer, as it is the freest bloomer, outside row of guard petals light pink, balance yellowish, with red markings on a few of the petals—near the center—very showy.

Queen Victoria is considered very fine by florists, because it ships and stores better than most of them; it is full white.

Model de Perfection, immense massive flowers like a big Chrysanthemum—set on a wide base of guard petals—color clear deep pink.

Beaute Francaise, a light lilac pink.

Eduis Superba, deep pink—very early and one of the most fragrant.

Delicatissima, one of the most in demand of the pinks, espe-

cially among the florists, delicate light shade of fine form and fragrance.

M. Barral, a fragrant dark rose pink.

MASSIVE.

Felix Crouse, one of the so-called bomb-shaped varieties—a rich red.

Purpurea Delachei, one of the darkest reds—with metallic lustre, like some of the very dark roses—the richness of the shade is emphasized by a few stamens.

RUBRA.

Richardson's Superba, still is a different shade of dark red, but without stamens, late bloomer.

Officinalis Rubra Plena comes one or two weeks earlier than the later kinds—a deep crimson—full flower, but rather short stems; in the same class belong *Officinalis Alba* and *Officinalis Rosca*, one a white and the other pink, valuable only on account of their earliness of bloom: not very free bloomers, and not as large as the later varieties.

Whittleyi, which is a pinkish white, not so very large, but the best keeper among all whites. We have another good white *Festiva*, blooming later than *Maxima*, being of the same color, but not so large. For years it has been called the Drop White on the Chicago market.

Marie Lemoine has a solid color of flesh white, very large full flowers, and compact habit.

In flesh colored pink varieties there are *Euboles*, a very large pink, showing yellow stamens, but very good. *Bryant Pink*, which is a solid color, and a very good keeper—a full sized flower.

Beresford is a delicate rose-tipped crimson, and a large flower.

Rosamond has a bright, clear pink color—a good, large, free bloomer.

This short list of varieties is merely a suggestion, but will serve to illustrate the range of color and habits it is possible to secure.

The culture of the peony, the Chinese herbaceous peony, originated in Siberia, its tuberous roots were used by the Tartars as an article of food—peonies grow in all kinds of soil, but

do best in a deep, rich, rather moist loam. A clay subsoil—if well drained is very beneficial when blooms are desired, but the Tubers ramify more in a lighter soil if grown for propagating purposes. In preparing the bed it should be thoroughly trenched, two feet deep, working in a great quantity of rich cow manure—as they are gross feeders—the ground should be kept well cultivated, and an annual top dressing put above the plants in November, which should be forked in the following spring. Peonies should have a liberal supply of water at all times, and especially when in bloom—liquid manure when applied during the growing season and at a season when the ground is dry, gives good returns, both in the growth of the plant, and size of the bloom in planting, the crown should be set two inches below the surface.

In transplanting, it is a good plan to remove all the old earth, so as to start with fresh unimpooverished soil next to the roots, flowers produced on small divided plants are apt to be imperfect, but when thoroughly established a plant will continue to bloom—if—undisturbed for twenty years. The period of blooming for herbaceous peonies ranges from the middle of May, through the month of June. Cold storage flowers of the old Late Rose were exhibited in fine condition, July 14th and 15th, at the Midsummer Fair, Lake Geneva.

They grow from one to three feet high, and therefore suitable for planting in front of shrubbery.

The single flowering sorts are not as popular as the double ones. They do not keep so long when cut, and fade more rapidly when on the plant.

Peonies, like most tuberous plants when dormant, stand considerable exposure, and can be shipped long distances in safety—small plants need two or three years after transplanting to recover their natural vigor—until firmly established in the soil they will not produce many blooms or very large.

The Peony is of great value as a landscape feature, and cut flowers, the clean dark green foliage, is quite in contrast to any other group of plants.

The Peony is never attacked by any insects, animals or fungal diseases—they do not require any covering during the severest weather—in fact they are among the most hardy, showy and easily grown of all garden flowers. Undoubtedly the Peony is one of the most effective of all early flowering herbaceous

plants for use in extensive landscape planting. It can be used in masses producing grand results; they can be interspersed among shrubbery, lending additional color to such groups. When out of bloom the plants are not sightly as is the case with many other herbaceous flowers, but the deep fresh greens and bronzy greens of the peony foliage are maintained in general good condition. The range of peony colors is unexcelled, it comprises almost all the shades of pink, from the most delicate flesh tints to the deepest, the same may be said of white, crimson and purple, in yellow however it is weak, there is no good color of yellow.

DISCUSSION.

Mr. Geo. J. Kellogg: What is the name of those early varieties, those called the old fashioned red?

Mr. Smith: *Officinalis rubra*.

Mrs. Marcia Howlett: Has anyone ever grown a peony with a very fine cut foliage like the Cosmos?

Mr. Tiplady: That is the Tumefolia. It is a very rugged flower. There is usually one flower on the terminal bud.

Mr. Smith: The tree peony is just as hardy as the other, but they do not last as a rule, they drop quicker. They are quite as hardy.

Mr. Moyle: I am glad to know that. I was under the impression that the tree peony was not hardy. How high do they grow?

Mr. Smith: They grow five feet high.

Mr. Moyle: And are perfectly hardy?

Mr. Smith: Yes, except you had better mulch them around the roots.

Mr. Drake: Have you ever found any trouble in keeping down the suckers around the roots?

Mr. Smith: No, I have found no difficulty.

Mr. Moyle: How do you propagate the tree peony?

Mr. Smith: All I have I have grafted.

Mr. Treleven: It is a very slow plant to propagate. It is of very slow growth. Of course, it is hard to get stock, and

I have never found any difficulty in securing success with suckers, but they have been of very slow growth.

Mr. Moyle: You can graft on herbaceous roots.

Mr. Reik: I would like to inquire whether this tree peony has been grown with success north of Oshkosh. I have a number of friends who have been trying to grow it but they met with a great deal of disappointment. I am thinking of trying it myself. I understand they are meeting with success in its growth in northern Illinois and southern Wisconsin. but I do not know whether it would winter here. We have some very severe freezes and I understand a great many of them are lost. Furthermore, I would like to ask the gentleman his opinion in regard to the beauty of the flower compared with other peonies.

Mr. Smith: I do not think so much of the tree peonies as I do of the others; they are short lived.

Mr. Reik: You do not think the average grower would meet with as much success and be as well satisfied with the tree peony as with the ordinary varieties?

Mr. Smith: No, sir, I don't think so.

Mr. Reik: There is nothing into which you can put your time and money with such a guaranty of good results as the peony.

Mr. Smith: The peony does not want to be confined much. After it is well established it will keep from twenty to thirty years.

Mr. Cranefield: I just wish to say one word in regard to the endurance of the peony. In the cemetery at Madison there is a clump growing that has blossomed every year for ten years to my knowledge, and as near as I can learn the clump was set out soon after the grave was made, and the tombstone bears the date of 1864; so it has been set out forty years and still continues to bloom.

THE DAHLIA.

W. S. BROWN, Madison.

The Dahlia is one of the best known and most important of our garden flowers. It belongs to the family, Compositae. Its original home was in Mexico, Central and South America. Although there are many names of species applied to this genus, most of them are synonyms, and may be resolved into eight or nine fairly distinct species. Most of the dahlias in cultivation have come from *D. Variabilis*. This species is the parent stock of our show, fancy and pompon varieties. The other common species is *D. Juarezii* from which the cactus types have sprung.

The Dahlia is closely related to the Cosmos and Coreopsis, and to the common weed, beggars tick. These relatives, the dahlia has surpassed both in the habit of doubling and in the profusion of colors. Its range of color, particularly, is very wide, lacking only the sky blue and closely allied colors. In this respect it surpasses its rival, the chrysanthemum.

The dahlia has been cultivated in Europe since 1789. Up to 1814 there were several well-defined colors among single dahlias, but until that year doubling had not begun. The doubling of this flower gave its cultivation a great impetus, and it soon became very popular. In 1841 one English dealer alone had 1,200 varieties listed in his catalogue, and it is estimated that at the present time over 3,000 varieties have been listed.

From 1841 on, little improvement was made, except in variety of color, until 1879, when the first cactus dahlia was introduced into England, and another field of development was opened up. The parentage of the cactus dahlia is uncertain; some claiming it to be merely a sport, of *D. Variabilis*, others that it is a separate species. Certain it is that a Dutch dealer obtained the root from Mexico which was the progenitor of the cactus type. The new find was named *D. Juarezii*, in honor of Pres. Juarez, of Mexico. This variety is still in cultivation, and may be found on catalogue lists.

Shortly after our Civil War there came a reaction against formalism in landscape art of all sorts. The round, regular

head of the dahlia suffered with the others, and it has been only within recent years that the flower has regained some of its old-time popularity.

Briefly, there are nine different types of dahlia recognized, based upon the size of the plant and upon the size, shape and color of the flowers. We can, however, include most of the popular kinds in four or five general types or groups.

First of all, both in time and importance, come the Show and Fancy Dahlias. "A Show Dahlia is often of one color; but if the edges of the rays are darker than the ground color, the variety can be exhibited in the Show section. A Fancy Dahlia always has two or more colors, and if the rays are striped, or if the edges are lighter than the ground color, the variety must be exhibited in the Fancy section." The pompon type differs from the Show and Fancy types chiefly in size and prolificacy. The flowers are much smaller and more abundant. They make a very good variety for massing.

In 1881, when the reaction against formalism was at its height, the Single Dahlia became very popular, and is still used to some extent in plantings for natural effects.

The above mentioned types have been brought to a high degree of perfection by long and patient training, and it would seem that there is relatively little chance for improvement. On the other hand, the cactus type is comparatively new and offers many chances for the enthusiastic propagator of new varieties. Another type which promises much in the future is the rather indefinite Decorative or Cactus Hybrid type. These flowers have been largely seedlings from Show Dahlias and their rays are rarely if ever curved at the margins.

Evolution and Improvement: The dahlia has had many friends; as proof of this it is only necessary to note the number of Dahlia societies in this country and in England. Interest in the flower became manifest early in its cultivation, and, as a result, evolution was rapid. Some points of improvement we may briefly note: (1) The shortening of the growing season. Formerly dahlias blossomed about two weeks before frost in this latitude, now we may have them for the Fourth of July. (2) The colors have been improved and variegated forms increased. (3) The doubling process has been perfected. (4) The habit has been changed from a tall, ungainly plant, which had to be supported on a stick to a low-branch-

ing, symmetrical, bush-like form. In this change of habit the stems of flowers have been developed longer, and now, the dahlia is popular for cut flowers.

We will turn, now, from this very brief history to the more interesting phase of the subject to many of us; the cultivation of the dahlia.

Dahlias are propagated in four different ways: By seeds, by cuttings, by grafting, and by division of root stocks. The first method is used when new varieties are to be obtained, and when mass effects without much regard to color are desired. Propagation by cuttings is the chief method of commercial growers and grafting is used to preserve weak or rare varieties, but neither of these is so suitable for the amateur as the last named method propagation by division of roots. This is done by dividing the root clump into as many divisions as there are tubers, as a rule, taking care that there is an eye present for each division. The eyes come not on the tuber, but on the crown and sometimes may best be started by placing in damp, warm place some time before dividing.

Such tubers may be planted about two weeks before danger of frosts is over; it will take them that long to push up through the soil. If small roots or green plants are used they should not be set out until danger from frost has past. Plant in rows four feet apart, and from eighteen inches to three feet apart in the row. Any good soil with plenty of humus and plant food will raise good dahlias. In general we may say that good corn land will grow them to perfection.

Commercial fertilizers are used to a large extent, but are best when mixed with well rotted manure. The manure should be well incorporated into the soil by spading or plowing. Thorough preparation and tillage of the soil are vital to the successful culture of this flower. In its younger stages the dahlia grows very rapidly and should be kept deeply and thoroughly tilled, but when older, deep tillage should be dispensed with as it is almost fatal to the production of bloom. When the plants begin to blossom, stir the soil frequently and thoroughly from 1-3 inches deep and never allow the surface of the soil to become baked.

There are great differences of opinion regarding watering but some of the best authorities prefer to water little except in time of prolonged drought and to depend instead upon con-

servation of moisture by means of a surface mulch made by cultivation.

With dahlias, plants which, naturally, grow tall and top-heavy trimming is an important feature. In planting place the tubers on their sides with the eye as near the bottom as possible, cover 2-3 inches deep. As the shoots come up pinch off all but the strongest one and pinch off the top of that shoot as soon as two or three pairs of leaves have formed. This induces branching under ground and a bush like form which is stronger and more symmetrical.

When the tubers are gathered in the autumn, they should be well cleaned and placed in a fairly dry cellar free from frost. If the air is too dry or there is danger from frost they may be packed in sand or sawdust.

The varieties a person should grow depends upon the tastes of the person and upon the purpose for which they are grown. For cut flowers the cactus hybrids, show, fancy and single dahlias are used. Varieties such as Grand Duke Alexis, large, chiefly white, Wm. Agnew, scarlet, Orange King, orange, etc., (C. W. Bruton, red and yellow) are good hybrids; (A. D. Livoni, pink), (Queen of the Yellows, yellow) (Purity, white) etc., are examples of the Show sorts; and Frank Smith, white, red margin, American flag, uncertainty, illustrate the Fancy type. For bedding, plants must be dwarf and profuse bloomers. Matchless (cactus maroon).

The dahlia has but one enemy of much importance, the tarnished plant bug. This insect is responsible for blasted buds and flowers, and for withered, blackened shoots.

Biobibliography, The Dahlia, Lawrence K. Peacock (1897).

Bul. 128 (Cornell) N. Y.

Bailey, Cyclopedica of Hort.

DISCUSSION.

Mr. Tiplady: My experience teaches me that the dahlia must be planted in low ground, for the reason that it is in that way easier to avoid the appearance of the red spider which is so destructive to the foliage of the dahlia, and if it gets a foothold

you will not have a blossom. Where the ground is dry that is where the spider likes to live, but on low ground he will not live.

Mr. G. J. Kellogg: In wintering dahlias last season I dried them well and put them in boxes, and when I set them out in the spring they nearly all failed. I have heard some say they put them in the potato bin which would furnish them about the right amount of moisture.

Prof. Brown: You do not want to let dahlias get too dry. It has been advised to leave them after cutting off the tops, in the sun for about a week before removing them to the cellar, and then keep them in a fairly moist cellar, not too dry. If you get them too dry and keep them too warm they are pretty sure not to develop.

Mrs. Marcia Howlett: If the cellar is too moist they will rot?

Prof. Brown: Oh, yes, it will not do to keep them too moist.

Mrs. A. D. Barnes: Did you ever try drying them in the sun before putting them in the cellar?

Prof. Brown: Yes, they are dried just the same as potatoes, but they do not need so much fresh air.

Mrs. Barnes: Would you advise putting them directly from the row into the cellar?

Prof. Brown: That depends on the condition of the ground when you dig them. If it is wet you had better leave them on the surface until the dirt is dry enough to rub off and then put them in the cellar.

Mr. Watson: In wintering dahlias first take the top off and then leave them out long enough to dry them off, and then put them in a cool cellar and in a dry soil, and I do not believe I ever lost a dozen roots in my life.

Mr. L. G. Kellogg: The best way to keep dahlia roots successfully is to put them in the cellar, letting them dry partially for two or three days and then packing them in barrels with small potatoes. I never had any trouble in keeping them in that way.

Mr. Tiplady: I saw a dahlia that stays out all the time. The gardener told me so and I believe him. All gardeners that have greenhouses put them under the bench and keep them between moisture and dry. If my observation is correct, and I think it is the dahlia that is known by the name of Sylvia is undoubtedly the finest known up to the present time. The bloom, shape and color is good, it is a good pink. I take pleasure in announcing that the Sylvia supersedes any variety I know of.

Mr. Periam: I have cultivated dahlias for fifty years, and I have never had better success in wintering them than putting them loosely in barrels and sifting in sand. The next best way is to put them in a cellar just moist enough to winter potatoes. Where the potato will winter in first class shape the dahlia is pretty sure to do so.

PREMIUM LIST, SUMMER MEETING.

Oshkosh, Aug. 29th, 1905.

FLOWERS.	1st	2d
	Prem.	Prem.
Best display Asters	\$2.00	\$1.00
Best display Comet Asters .....	.50	.25
Best display Branching Asters .....	.50	.25
Best display Quilled Asters .....	.50	.25
Best display Single Dahlias	1.00	.50
Best display Double or Show Dahlias.....	1.00	.50
Best display Cactus Dahlias	1.00	.50
Best display Gladiolus	1.00	.50
Best display Perennial Phlox	1.00	.50
Best display Pansies	1.00	.50
Best display Stocks	1.00	.50
Best display Single Petunias	1.00	.50
Best display Double Petunias	1.00	.50
Best display Double Verbenas	1.00	.50
Best display Cosmos	1.00	.50
Best display Golden Rod	1.00	.50
Best display Native Asters	1.00	.50
Best display Native Ferns	1.00	.50
Best display Wild Flowers	2.00	1.00
Best display Garden Flowers	2.00	1.00
Best, most artistically arranged, bouquet or vase of garden flowers	1.00	.50
Best, most artistically arranged, bouquet or vase of wild flowers	1.00	.50
Best exhibit flowers, to be judged by the following scale of points:		
No. of varieties shown	75	
Quality	15	
Correct nomenclature	10	5.00
		2.50

FRUIT.

APPLES.

Best plate Astrachan	1.00	.50
Best plate Early Harvest	1.00	.50
Best plate Early Joe	1.00	.50
Best plate Oldenburg	1.00	.50
Best plate Tetofski	1.00	.50
Best plate Transparent	1.00	.50

PLUMS.

Any variety named in Society Fruit List (1904).... .50 .25

Specimens of plums must be fully colored and ripe enough for culinary use.

Four apples to be shown for a plate.

In plums not less than ten specimens shall be considered a plate.

FOR THE YOUNG PEOPLE.

Premiums for displays of flowers grown by boys and girls under 14 years of age.

	1st	2d
	Prem.	Prem.
Best display Asters	\$1.00	\$.50
Best display Dahlias	1.00	.50
Best display Gladiolus	1.00	.50
Best display of garden flowers other than above...	1.00	.50
Best display wild flowers (collected by exhibitor) ..	1.00	.50

PREMIUMS AWARDED.

At the session Tuesday afternoon premiums for flower displays were awarded as follows, the judges being W. J. Moyle of Union Grove and A. J. Smith of Lake Geneva:

Asters—First, Mrs. L. W. Barnes; second, Mrs. D. D. Howlett.

Comet asters—First, Mrs. Barnes; second, C. Phillipson.

Branching asters—First, Mrs. D. D. Howlett; second, C. Phillipson.

Single dahlias—First, R. J. Coe; second, Mrs. Barnes.

Double dahlias—First, Mrs. Barnes; second, Mrs. W. E. Thrall.

Cactus dahlias—First, R. J. Coe; second, Mrs. Barnes.

Gladiolus—First, R. J. Coe; second, Mrs. Barnes.

Perennial phlox—First, G. M. Snyder; second, R. J. Coe.

Pansies—First, Mrs. J. J. Ihrig; second, Mrs. Barnes.

Stocks—First, Mrs. Barnes; second, H. C. Christensen.

Single petunias—First, Mrs. Barnes; no second.

Double petunias—First, Mrs. D. D. Howlett; second, Mrs. Barnes.

Verbenas—First, James W. Stephens; second, Mrs. W. E. Thrall.

Cosmos—First, H. C. Christensen; second, Mrs. Barnes.

Golden rod—First, C. Phillipson; second, Mrs. Payton.

Native asters—First, Mrs. D. D. Howlett; second, Mrs. Marcia Howlett.

Native ferns—First, Mrs. Marcia Howlett; second, Mrs. D. D. Howlett.

Wild flowers—First, Mrs. Marcia Howlett; second, C. Phillipson.

Bouquet of garden flowers—First, Mrs. Barnes; second, C. Phillipson.

Bouquet of wild flowers—First, Mrs. Payton; second, C. Phillipson.

Sweepstakes—First, R. J. Coe, Ft. Atkinson; second, Mrs. L. W. Barnes, Waupaca.

YOUNG PEOPLE'S DISPLAY.

Asters—First, Fern Payton; no second.

Gladiolus—First, Burleigh F. Howlett; no second.

Garden flowers—First, Shirley Holmes; second, Fern Payton.

Wild flowers—First, Fern Payton; second, Burleigh Howlett.

AWARDS ON FRUIT.

The following awards of first and second premiums on the display of fruits were made by the judge, L. J. Kellogg of Ripon:

Apples, Astrachan—First, J. W. Stephens; no second.

Earl harvest—First, J. W. Stephens; no second.

Oldenburg—First, M. V. Sperbeck; second, Mrs. Payton.

Tetofski—First, M. V. Sperbeck; no second.

Transparent—First, M. V. Sperbeck; no second.

Plums, Green Gages—First, H. C. Christensen; no second.

Transactions of the Winter Meeting.

MORNING SESSION.

MADISON, WIS., February 6, 1906.

The meeting was called to order in the assembly room of the capitol building at 10 o'clock A. M. President T. E. Loope in the chair.

PRESIDENT'S ADDRESS.

DR. T. E. LOOPE.

Since we last met in annual conclave your officers have had many and varied duties to attend to and while it has seemed uneventful compared to a year when an exposition was in progress, for that reason we have not been so prominently in the public eye yet. I believe our work has tended toward laying the foundation for future usefulness and the dissemination of horticultural truth.

A gratifying item is the increased membership over other years. This has not come by reason of our auxiliary societies but has come from widely scattered localities where interest has been awakened in our work by people who have horticultural interests or instincts irrespective of local societies. It would seem that our local societies are built and maintained very largely by one or more enthusiastic persons who are willing to expend much valuable thought and time for the benefit of the

many, who have no care beyond being amused or absorbing knowledge from others. This is putting it mildly and those of us who have worked in this field know it to be absolutely true in a general sense. Even then many local societies, containing members who are enthusiastic and eminent in horticultural work have collapsed from sheer indifference of the members.

This is unfortunate for the state society for with well organized and helpful auxiliaries in all sections of our state our prestige would be vastly increased and our usefulness extended. As it is now we must force a recognition of our beneficent work by main strength from the fountain head and instead of many streams on which to float our leaves of knowledge we must blow them upward trusting to chance winds to carry them home to the seekers after more light.

Horticulture stands in similar relation to agriculture as literature, music and the fine arts do to scientific education. As an adjunct to agriculture it goes beyond the mere tillage of the soil for the profit there is in it and puts on the finishing touches and delicate furnishing to what would be ordinary coarse living without change or diversity. Agriculture gives you bread, potatoes and meat for the substantial muscle building diet. Horticulture adds fruit in endless variety which gives infinite zest to appetite and stimulates digestion which enables one to assimilate the coarser and more strengthening food. It adds flowers to please the eye and leads one through pleasant ways nearer to nature and the contemplation of higher ideals and nobler actions. To the human race it stands a close second to agriculture.

Believing this assertion to be essentially true we nevertheless find that agriculture is a power that commands great attention in all our great educational institutions and is supported by an imposing array of professors and a vast amount of money appropriated by the state. Horticulture on the other hand has had to struggle along with few teachers in our institutions. State horticultural societies like our own, that have made a study largely a labor of love, are recognized by small appropriations utterly inadequate to its pressing needs and the importance of its mission.

Believing in the advancement of the science and practical work of horticulture as an essential and valuable asset to the state for the general happiness and comfort of our inhabitants,

for the more refining influence of the home and the health giving properties of its products, we should seek some means for substantially advancing our cause in the estimation of the masses. I believe our remedy consists in gathering into our membership men who are factors in political affairs, men who will voice our necessities (and objects in the legislative halls). Every member should use his best efforts to see that the legislator in his district is favorable to our cause. Educate him in the elements of horticulture. Make it a personal duty to do this. When this has been accomplished we can widen our sphere of action and spread the gospel of horticulture to every household.

Our society has at present a fair appropriation for the work as it has been in the past, but with plans as outlined for the future we shall be seriously handicapped unless we can see an increase when the legislature meets.

Our trial orchards require an increased outlay to properly care for and keep them in good condition. In addition to those already planted the society has located one in Barron county, and has taken preliminary steps towards one in Marinette or Oconto county. If we do this missionary work we will surely need more funds to carry our experiments to a practical and intelligent consummation.

We deserve recognition and must secure it. It would seem that every progressive horticulturist should make it a duty to attend the winter meeting. The cost is not excessive and the stimulus received keeps alive the enthusiasm so necessary to the successful prosecution of his vocation. Cowper hits the nail on the head when he says:

“How much the Dunce who has been sent to roam
Excels the Dunce who has been kept at home.”

If there are those who think we have not accomplished as much as we ought, I have this to say to them, that I believe every officer of our society has its best interests at heart and have intelligently and earnestly without thought of selfish ends, worked as they thought best for its advancement. The main thought has been to secure the greatest good to the greatest number—to popularize the work—to present the best thought as widely as possible—to give correct and up-to-date information—to keep ever before the public the importance of the society to the whole commonwealth. You have in your ranks men of

wide practical information, acute business sagacity and versatile accomplishments in their lines. There are no abjectors or disorganizers, consequently we should be a happy family.

It is no disparagement to others to speak of the efficient and energetic labor of your Secretary. Upon his shoulders rests largely the weal of your society. He is untiring, intelligent, enthusiastic and in a comprehensive slang "Johnny on the spot." I desire to say that with these happy combinations my office has been a pleasure to me and the associations connected with it are the source of great satisfaction.

REPORT OF SECRETARY CRANEFIELD.

The record of this society for 1905 is one of distinct progress. We are moving ahead at a rapid pace.

The membership roll now includes 350 names. These are all either life or annual members whose dues are paid in full. We carry no dead timber. As soon as a membership expires the member is notified and if the renewal fee is not received within a reasonable time his name is dropped.

The increase in membership since my last annual report is 133 or a gain of 62 per cent.

While this increase is not as much as we all desire the increase in interest has been very marked. While in the past many of our annual members renewed from a sense of duty or from force of habit the prestige of membership in our society is now coming to be valued.

The trial orchard work is attracting wide attention and favorable comment. Applications for our bulletins are steadily increasing and extracts from these as well as reports of our conventions have appeared in the agricultural press throughout the United States.

Our delegates who have visited other states report most gratifying comments on the work of our society.

On the whole it seems fair to report the society in a prosperous condition. A report of the transactions of the society follows:

REVISION OF THE CONSTITUTION.

At the last annual meeting a revision of our constitution and by-laws was adopted.

The revised constitution includes the following new features, given in the order in which they appear in the revised document.

1. The appointment of the secretary by the executive committee.

2. Abolishing the office of corresponding secretary.

3. Provision for the election of members of the executive committee from the different congressional districts by the delegates elected by the local societies in each district.

4. An article defining local societies.

5. Fixing Madison as the place of meeting for the annual convention.

6. An article creating a board of managers consisting of the president, treasurer and secretary, empowered to conduct the business of the society in absence of the executive committee.

The revision of the by-laws provide:

1. That the secretary shall also be superintendent of the trial orchards subject to the direction of the trial orchard committee.

2. Providing for regular bi-monthly meetings of the board of managers.

3. Defining the duties of the trial orchard committee and providing for an annual inspection of all of the trial orchards by this committee.

The provision creating the board of managers has aided materially in placing the society on a sound basis in the transaction of business.

The board held six meetings during the year as follows:

Madison, February 10th.

Milwaukee, March 28th, June 3rd, August 4th, October 6th, December 4th.

Oshkosh August 29th.

Three meetings of the executive committee were held. At Madison February 6th and 10th and Oshkosh August 29th.

A detailed report of the proceedings of these meetings is on record in the secretary's office and will appear in the printed transactions for 1906.

ANNUAL REPORT.

The annual report for 1905 a volume of 329 pages was delivered by the printers May 1st and about 2,000 copies have been distributed from the secretary's office as follows:

County clerks.....	890
Short course students.....	325
Members	350
Individual requests.....	120
To exchanges etc.....	300

1,985

BULLETINS.

Four bulletins have been issued during the year.

No. 4 spraying, March, 1905, 25 pages, 18 illustrations; 2,500 copies; cost of printing \$70.00.

No. 5. Fire blight, May, 1905. 8 pages, 1,500 copies, cost of printing \$16.50.

No. 6. A preliminary orchard survey of the Kickapoo river region October, 1905. 11 pages; 750 copies, 4 illustrations: cost of printing \$22.50.

No. 7. Buying nursery stock December, 1905; 1,500 copies. 8 pages; cost of printing, \$16.50.

Of bulletins 1, 2 and 3 issued in 1904 the supply is exhausted. Several hundred copies each of Nos. 4 and 5 remain and about 100 each of Nos. 6 and 7.

The bulletins have been generally well received and if we could by any means learn what the people need I am satisfied our bulletins would become a most important feature of our work.

The remarkable demand for No. 7 illustrates this. This bulletin was issued, I will frankly state, to fill a gap, to complete the quarterly issue for 1905 and contains but little else than the fruit lists taken from the annual report and yet the demand for this has exceeded that of all others combined, while bulletin No. 4 on spraying for which it was supposed there would be a wide call remains undistributed.

Other publications during the year include a list of herbaceous perennials and different forms of advertising matter.

The summer meeting at Oshkosh was well attended and marked by unusual interest on the part of all present. The pro-





Partial views of exhibit of Wisconsin State Horticultural Society at Dane Co. Fair, Madison, Sept. 19-22, 1905.

gram, devoted wholly to the discussion of a single class of decorative plants, was well received. The exhibit of flowers, including both cultivated and native, was probably the most extensive in the history of the society.

The society exhibit at the state fair included a collection of photographs illustrating the work of the society, models of grafting, pruning and budding as well as an extensive exhibit of fruit from the Wausau orchard and about a hundred plates contributed by members.

While the state fair exhibit cost about \$120 it is believed that we received full returns in advertising and increased membership. A portion of the exhibit was installed at the Dane county fair at Madison but the returns were not satisfactory.

LOCAL SOCIETIES.

The local societies that reported last year are all represented here today and will inform you of their work as called on. In addition it is with much pleasure that I record the association with this society of the Lake Geneva Foremen's and Gardener's association of Lake Geneva, a newly organized local society of great strength. This society is composed exclusively of skilled gardeners and every member is also a member of the state society. The great interest manifested by the members of the Lake Geneva society in the work of the state society and their union with this society in a body is to be commended to the other local societies of the state of which less than two per cent are members of the state society.

CONCLUSION.

This is a brief review of the work of the society for the past year. It would seem fitting in conclusion to look ahead to the coming year.

The society is now working on broader lines than ever before in its history; these must be strengthened and other fields of usefulness included.

The trial orchard work is greater than any ever undertaken heretofore by a state society and when carried to completion will stand as a monument to those who conceived and executed it.

While the trial orchards are bound to prove of inestimable

benefit to the people of northern Wisconsin they absorb a very large part of our attention and resources. I recommend a diligent prosecution of the work as at present established without further enlargement. The five orchards now located, cover practically all of the different undeveloped conditions of northern Wisconsin and the establishment of more would be merely a duplication of the present work. In aiming to develop the resources of the state the southern half should not be forgotten. The possibilities of tree-fruit culture in southwestern Wisconsin have been briefly outlined in bulletin No. 6. The people of this region need only an awakening and intelligent direction to develop one of the best and most productive apple regions in the west and I have no doubt that there are other sections of southern Wisconsin where questions of hardiness, etc., were settled by the pioneers in our society 50 years ago, which await only a demonstration of their resources to make of them productive fruit regions.

Co-ordinate with the encouragement to plant trees must come a demonstration of the means of protecting them from insects and diseases. No more practical and helpful work could be undertaken by this society than well advertised public demonstrations of spraying in different localities in the state.

These and similar lines of work show the almost unlimited opportunities which we possess to benefit the people of Wisconsin.

The Wisconsin State Horticultural society now stands on a widely different basis than the society of twenty-five or fifty years ago. In the beginning when the society was supported financially by the contributions of the members it was but reasonable that the benefits accruing from the association should be largely for the members. Now that we solicit and accept the bounty of the state of Wisconsin, we must endeavor to give to *all* of the people of the state just returns for this aid. We can no longer feel that our funds, coming as they do from all of the people of the state are to be expended exclusively for our own benefit. It is right and just that the members, those who pay a fee and thus manifest an interest in the society should receive direct benefit when possible, and as your Secretary I have spared no effort to give help to all who have asked it.

Certain prerogatives are and should be inherent in membership but a membership should also imply an obligation to labor in a wholly unselfish manner for the advancement of the so-

ciety's interests and the reward for this must be in a consciousness of a duty well done. The individual members, *only*, can make this society the largest and most influential in the United States.

The officers, to whom are intrusted many duties, must be diligent and faithful in the discharge of these duties but in order to accomplish that at which we aim there must be co-operation on the part of every member. When the time comes that every member asks, not "how much can I get from the society, but how much can I give to the society of my time and influence," then and not till then will we be on the road to the highest success.

REPORT OF SUPERINTENDENT OF TRIAL ORCHARDS.

F. CRANEFIELD.

Many facts relating to the trial orchards for the past year will be omitted as two reports by the trial orchard committee follow.

WAUSAU.

This orchard was visited but three times this year, viz.: in April, July and September.

In April seventy-eight apple trees were planted to fill vacancies,—25 wealthy, 25 N. W. greening and 28 of other varieties.

The orchard was sprayed three times with Bordeaux combined with Swift's Arsenate of lead. In spite of this the fruit was very scabby and quite wormy. The foliage was comparatively free from the scab fungous. This is in marked contrast to the season of 1904 when the fruit was absolutely free from worms and almost free from scab.

I hesitate to give what I believe to be the reason for this condition lest it be construed as self-praise and yet my convictions are so strong that it must be stated. It is this:

The spraying was not properly done. In 1904 I superintended the spraying and if you will permit me to say it the spraying

was thoroughly done. In 1905 I relied on the man in charge who expressed the greatest confidence in his ability to do the work properly. The results were very apparent.

There is one very important point in spraying for codling moth and scab that is apt to be overlooked viz., that every apple must be covered with the spray; spraying the leaves will not protect the fruit.

The rainy season interfered with cultivation at Wausau as in the other orchards but toward the end of the summer the grass and weeds were subdued and a cover crop of oats sown.

A fair crop of fruit was borne by all varieties of apples except N. W. Greening and Wealthy. Hibernial, Longfield and Patten Greening were especially well loaded. Cherries and plums were also a fair crop. The cherries were sold on the trees to Gilman & Rick of Wausau as was later the entire apple and plum crop. The trouble reported last year as affecting the N. W. Greening trees has not abated. Several of this variety perished last year and the disease has extended to adjacent rows of Wealthy.

Specimens including the trunk of an affected tree were sent to Prof. Galloway at Washington who pronounced the disease *Sphaeropsis malorum* or apple canker. This is a fungous attacking, as a rule, only trees which have been weakened from some cause. This cause has not yet been determined.

Mr. C. Bues, State Nursery Inspector was requested to visit the orchard in August and report on conditions. His report which is submitted, herewith, is to the effect that the underlying cause is lack of drainage and that the trouble can be remedied by tile draining a large part of the orchard. In pursuing the investigation Mr. L. P. Haskins, a soil expert, at my request made an examination of the sub-surface soils and reported as follows:

"I have taken samples of the soil and of the sub-soil from your orchard near Wausau and examined carefully the surrounding country for conditions adverse to good natural drainage. After examining the soil and sub-soil samples quite carefully keeping in mind the lay of the ground, I am of the opinion that sub-surface or tile draining is absolutely useless for your orchard. It seems to me you could not have more perfect drainage than you have there. I speak now of sub-surface drainage and I do not see how tiling could add to

it in the least. I have showed the soil samples to Prof. Whitson and described the location as well as I could and he is of the same opinion concerning drainage."

Thus do doctors disagree! To show how great a diversity of opinion may exist one of our members who examined the trees stoutly maintains that the whole trouble is caused by improper pruning in the beginning leaving bad crotches in which ice collects etc.

While no solution has been reached of the problem the remedial measures suggested by Prof. Galloway such as removing the canker spots etc. will be applied next spring with the hope of checking the disease.

The net cost of the Wausau orchard during the past year is shown by the following report.

Expenses.

Rent	\$50 00
Labor	121 95
Material for spraying	23 50
Orchard disk	22 50
Pruning tools	1 50
Labels	3 00
Tree protectors.....	5 00
Trees	7 80
Expenses of Superintendent not including milage ..	35 12
Per diem G. J. Kellogg and A. J. Philips revising records	40 00
Expenses as above	40 91
Total	<hr/> \$351 28

Receipts:

Gilman & Rick for cherries	\$12 18
Gilman & Rick apples and plums	100 00
Total	<hr/> \$112 18
Balance or net cost	\$239 10
Cost for 1904	255 73
Cost for 1903	286 30

EAGLE RIVER.

Early in April a careful examination of this orchard by Mr. W. H. Adams showed a disastrous condition of affairs similar to that in 1904 viz., winter killing of practically all of the apple trees in the orchard and many of the plums. The orchard was replanted early in May, the planting season for this region, native plums being substituted in many cases for apples. In all 278 trees were planted; 206 apple and crab; 44 plum and cherry.

At the suggestion of several residents of Eagle River who believed that an elevated site on heavier soil would be more favorable 20 trees were planted on such a site on the farm of Mr. Adams. Under date of Jan. 19th 1906, Mr. Adams reports these trees all alive and in good condition.

Report of W. H. Adams.

F. Cranefield,

Madison, Wis.

Dear Sir: Am in rec't of your favor of the 18th, wanting me to report on the little trial orchard at our farm.

The trees are all alive, the bark is in perfect order, not a twig or a branch died. They made from 8-12 inches growth, the root growth was equally as great. They went into winter quarters with not a speck of fungous growth on their leaves. The bark is absolutely smooth.

The Wisconsin trial orchard here is in pretty hard shape. We had a snow storm about Oct. 19 and it broke the limbs and left them in bad shape. They should have proper care in the spring or the orchard will be practically lost.

The orchard made excellent growth this year and should have credit for it.

W. H. ADAMS.

The cultivation in the Eagle River orchard was continued as last year. We must keep on planting and hope for better things.

Financial Statement.

Rent	\$25 00
Labor	135 00
Tree protectors	15 40
Trees	37 44
Expenses of superintendent except milage .	6 50
<hr/>	
Total	\$219 34
Cost 1904	375 24
Cost 1903	236 21

POPLAR.

Of the 489 trees planted in the spring of 1904 all but 41 survived. These were reset last May and the second plat of five acres planted.

The trees made but a poor growth owing probably to excess of water in the soil and some fears may be entertained as to the outcome next spring.

The almost continuous rains during the growing season interfered seriously with cultivation and the growth of grass and weeds was allowed to remain as a cover crop. The work of converting the dumping grounds leased from the Northern Pacific R. R. into a park progresses slowly but surely.

That we are not alone in the effort to develop the fruit-growing industry of Northern Wisconsin is shown by letters received from Mr. A. B. Warner of Ashland and Mr. Knight of Bayfield. Mr. Warner who is secretary of the Keystone Lumber Co., of Ashland, has planted on land 13 miles south of Ashland, two trees each of 58 varieties of apples, 4 of crabs, 6 of plum, 5 of cherry, 1 of pear, 3 of peaches, and 1 of quince, making an experimental orchard second only in importance to our Poplar orchard.

While Mr. Warner's orchard is purely for pleasure and experiment Mr. Knight is entering the field of commercial orcharding and expects to plant next spring twenty acres of apples of nine varieties.

In a recent letter Mr. Knight says: "I have been observing apple trees grown here for the last thirty years and I am not afraid of failure of the hardy kinds."

Financial Statement.

Rent	\$75 00
Rent park sites	2 00
Labor	155 87
Trees and shrubs	132 44
Tree protectors	12 00
Fence material	7 58
Pruning tools	2 50
Expenses of superintendent	35 90
<hr/>	
Total	\$423 29
Cost in 1904	\$401 42

MEDFORD.

The Medford orchard suffered to the extent of 69 trees which were reset last spring. The orchard was found to be in excellent shape on my visit in May, due to the intelligent and painstaking efforts of Mr. Harris who spends his entire time in the orchard in spring and summer.

Financial Statement.

Trees	\$9 83
Pruning tools	2 00
Oats for cover crop	2 48
Expenses of superintendent	14 00
<hr/>	
Total	\$28 31
Cost 1904	\$83 20

In conclusion if I may offer suggestions as to the future of the trial orchard work it would be to repeat the thought expressed in the report as Secretary, viz., that no more trial orchards be established for several years, at least. The tried and tested regions of the state demand our attention. A portion of the remaining five acres at Poplar might with advantage be devoted to testing seedlings and new varieties whether from our own state or elsewhere. In addition if desired hundreds of thousands of seedlings might be grown here at slight expense to be distributed among our members for testing; after this if space remained, from one hundred

to one thousand root grafts of each of the different varieties now in our orchards might be planted with the object in view of furnishing our own home grown trees for filling vacancies in our orchards.

REPORT OF TRIAL ORCHARD COMMITTEE—ANNUAL INSPECTION.

S. H. MARSHALL.

Mr. President and Members of the State Horticultural Society:

Your committee made a partial report of their inspection of the trial orchards at the summer meeting, but will try and make a more extended one at this time. The orchard committee consists of Dr. Loope, Mr. Coe and myself, and in accordance with the rules of our society we inspected all of the trial orchards, during the last week in July.

At Eagle River where we made our first stop we found the orchard situated about a mile north-east of the town, consisting of five acres of nearly flat sandy land. The first trees were planted in 1901 and balance the next year. Of these original plantings a great part of the apple and cherry trees had been killed off during the hard winter of 1903 and 1904, but as a great many young native forest trees were killed at the same time we thought best to replant and try again. It would be hardly fair to say that it was impossible to raise apples in this part of the state without giving it a further trial. The trees were not root killed, but were killed at the top, the trunk being alive in many cases a foot or more above ground, or presumably up to the snow line. The young trees and those that had survived we found doing nicely as only 24 were dead and of these 14 were older trees that had been cut back in hopes that they would live. We found the orchard in a very fair state of cultivation considering the season. There did not seem to be any marked degree of difference in the hardiness of the various kinds of apples. We recommend that two more rows of cherries be planted the length of the orchard of the far side from town, to consist of 2-3 Early Richmond and 1-3 L. Montmorency.

Our next stop was at Wausau. The orchard here is about three miles north-east of town on high land and most of it well drained. The soil is a clay with numerous small stones in it. Here we were greatly alarmed over some disease that had played havoc with a number of trees and seemed to be spreading. This we decided was apple canker and our Secretary we found had sent a tree to Washington and they pronounce it that, and have given him some instructions as how to eradicate it and he is at work on it now. It is fortunate in one way that the disease should make its first pronounced appearance in a state orchard instead of a private one, as it gives us a chance to experiment with ways and means to stop it and give out the information we may gain to others who may be so unfortunate as to be afflicted in the future. We also found that the orchard was badly infested with scab, though Mr. Crane field insists it was thoroughly sprayed. This may be accounted for by the weather conditions, thick fog most every morning until nine o'clock and lots of rain, or as I am inclined to think, some imperfection in applying the spray. Saw but two cases of blight. We found 73 dead trees and about 50 more or less damaged. A good part of this destruction was done by apple canker, but some of it was done by winter killing and too deep plowing close to the trees. A few of the cherries from being planted on swales were suffering from wet feet and we recommend that plums be planted instead of cherries in these places. We also recommend not to replant any trees in east row, but to let that row die out. We did not find as much fruit as we expected and what there was of it was so badly infected with apple scab that it was hard to judge of it at this time. The most promising varieties (as to fruit) were Hiberna, Patten's Greening, Okabena, Milwaukee and Gideon. The plum crop was poor and the cherries were badly infested with shot hole fungus. From all we could discover the trees of the N. W. Greening seemed to suffer more from the canker than the others. Perhaps a fairer way to put it would be that the disease started with this variety and killed seven trees and then spread to the Longfield and killed six in two rows. Two rows of McMahan seem to be immune as only one appears to be affected. Next to these come two rows of Wealthy where we found about ten trees either dead or dying. The

Wealthy by the way does not seem to do well in this location. Next to the Wealthy we find a row of Peerless with only two dead trees, then comes a row of Newell with one tree badly diseased. Two rows of Hepka Malinka suffered more with two dead trees in each row. These eleven rows seem to cover the damaged trees.

Our next stop was Medford where we found the orchard about two miles from town, in a good situation except for a ditch and some low ground in one corner. The soil is clay and somewhat similar to Wausau but heavier and more stony. This orchard consists of three acres and we found it in a most perfect state of cultivation. The trees looked thrifty except where the apple trees were affected by sun scald, caused by their being topped too high. There was only one dead tree in this orchard of three acres that could not be traced to wet feet. We recommend that these dead apple and cherry trees be replaced with plum. The first trees in this orchard were planted in 1902. They are too young to draw any conclusions as to the adaptability of the different varieties. The trees seem to have all made a fair growth, 13 dead in all.

Poplar is a small town on the N. P. Ry. between Superior and Ashland and about eighteen miles east of Superior. The orchard is just across the road from the station, which gives it a very public location. The orchard is fifteen acres and five acres were planted spring before last and five more last spring. The soil here is a very stiff clay and we have been unfortunate in having two extremely wet seasons. Last summer at the time of our visit they had hardly a day that they could get into the orchard to cultivate and the grass and weeds had a good start. Wherever there was the slightest depression in the ground there water stood and the trees were either dead or sickly and it looks as though we would have considerable replanting to do here, with 84 dead trees and more that look as though they would die before spring. The balance of the orchard showed a good growth for the trees that had been planted two years and only a scant growth for those set last spring. Nearly all the cherry trees were dead except one row that had a dead furrow plowed on each side of it and this emphasizes a lesson that was plainly shown at the other orchards. Cherries will not do at all well except where the soil is perfectly drained. We

recommend that in the future all cherries planted in this orchard have a dead furrow plowed on each side of the row and that some surface draining should be done at once.

REPORT OF TRIAL ORCHARD COMMITTEE—LOCATING ORCHARDS.

R. J. COE.

At a meeting of the executive board of this society held at Oshkosh during the summer meeting in August it was decided to locate two new trial orchards, both in the northern part of the state. One on or well toward the east side and the other over toward the west side, and the trial orchard committee was instructed to proceed to select these sites. Agreeable to these instructions your committee agreed upon a date and decided that we would inspect the eastern side first. Along in October we went to Oconto as a sort of headquarters and from there traveled by team and rail over quite a large tract of territory in Oconto and Marinette counties. Unfortunately we did not succeed in finding just what we thought would meet all the requirements. To the west and southwest of Peshtigo we found some splendid orchard sites but this particular section had been settled for a good many years and it is quite evident that it was settled by people who had grown apples in their former homes for nearly every farm had a good sized orchard and they were all located to the best advantage and they seemed to be in splendid condition. This section would undoubtedly be a good place for a trial orchard but as an object lesson it is not needed for the settlers have already demonstrated that it is a first class apple section. The other sections we visited did not seem to your committee to be just what should be selected. While we found some locations that seemed to be well suited to the purpose they were so out of the way that they would not be seen by enough people to make it worth the time and expense of establishing and maintaining an orchard in those localities. We thought that whenever a trial orchard was located it

should not only be a location favorable enough to make success fairly certain, but that it should be on a main traveled road where it could be seen by a good majority of the people of the vicinity. We had planned to visit one more locality on this afternoon of the last day. We felt that we could not spare the time but found we could not get a train that afternoon and it was too far to drive so we arranged with Dr. Loope for him to go the next morning to investigate that section, but he did not find conditions such that he thought we would be justified in locating an orchard in that section. Leaving Oconto at night the balance of the committee went across the state to see what could be found over on the west side. We thought Barron county would be about the right locality and decided to go there and if we could not find what we wanted there we would then look elsewhere. Mr. Marshall remembered a Professor Cheney (a former professor in the university whose health had failed) who had located at or near Barron and thinking that he might be of a good deal of help to us we headed for that place. We found our man and at the same time found what seemed to us to be an almost ideal place for a trial orchard, on his farm being a good clay soil gently rolling and situated on a main road just outside the thrifty growing village of Barron. Taken all in all I believe it is the opinion of your committee that this is one of the best if not the best site for a trial orchard we have thus far. While we did not locate the two orchards we set out to do (we felt that in an enterprise of this kind it was best to make haste slowly) we came home feeling pretty well satisfied with the results of our trip.

DISCUSSION.

Mr. Irving Smith: I don't know whether it is in order to discuss varieties or not at this time to put into the trial orchards, but I have noticed in the matter of cherries that none of the Russian varieties are ever mentioned. I would like to ask the question why some of the Russian varieties are not used in these experiments? There must be some reason for it.

Mr. W. J. Moyle: Perhaps the Russian cherries would be a great deal like the pears that have been sent out from that

wonderful country. The Russian pear is practically worthless, and a great many of the Russian cherries, as I remember them at the experiment station, were not hardy, a large majority of them, not even as hardy as our own best varieties. I think that is the reason they have not been experimented with.

Mr. D. E. Bingham: We have a few of the Russian cherries and they seem to be just as hardy as the Montmorency and just as nice a fruit and I would like to see some of them planted in the orchards.

The President: They have the names of the Russian varieties so badly mixed up that we often get four or five varieties under one name.

Mr. Smith: I do feel inclined to dispute what Mr. Moyle has said, because a great deal of the stuff that is sent out under the name of Russian is worthless, but still we keep buying of our nurserymen and we must have cherries. Now I think even Mr. Moyle will admit, if he will come up to our place in season, that there are some Russian cherries that are good in some locations. About twenty years ago, I don't know but it was more, we set out 75 Russian cherry trees. We bought them of a man in Oconto named Cook, who was an enthusiastic Russian cherry man and he grew them there. They came to us by the name of Oral and Ostheim. When they came into bearing, instead of two varieties there were three or four. The earliest ones were very bright red, and good quality sour cherries. Then comes another variety a little later, similar to that earliest one that is also very fine, most elegant quality when they are ripe and most disreputable when they are green. Then some that are quite dark, the kind, I should say that would be called a black cherry, although they are not black, but a very dark red. They have a little more of the astringent taste, but a very good market cherry. We have two of the dark ones, and in all the years that we have had those cherry trees we have never failed to get a fair crop and in most years a good full crop of cherries year after year. Some of those trees are dead now, but there have not any died for a number of years, except there was some very apparent reason for it.

Mr. M. S. Kellogg: I would like to ask a question along the line of Russian cherries and our native varieties, can Mr. Smith compare these cherries with the English Morello, Early Richmond or Montmorency and these classes that we all know, grown on the same ground and under the same conditions?

Mr. Smith: All I can say on that is, that we have set out for the last ten years, since I began to fill in where there were some dead, with the common cherries, and I have as yet failed to get enough to try, to compare with the others. Most of the trees are dead and those that are not dead look as though they wished they were,—never had any fruit on.

Mr. A. Brackett (Minneapolis): I cannot say in regard to cherries in this locality, but around Minneapolis and around Lake Minnetonka they have planted thousands of dollars worth of cherry trees, both Russian and our native cherries, and I do not think that a cherry tree is standing there today, and those that did bear a few just bore enough to supply the birds, they always get their share first anyhow. We have a composite cherry there, which is not really a cherry, but a cross between a cherry and a plum, and that is the only thing we get cherries from up there.

Mr. Moyle: In relation to these Russian cherries,—we tested those cherries thoroughly at our station at Madison. At least 75 per cent of those Russian varieties that we had did not blossom and bear a cherry. There was a variety there that I feel distinctly in love with; it was a dwarf growing tree, very hardy and productive and if I had a commercial orchard I would plant that variety. I wrote to Prof. Budd, asking if it was possible to get some of those cherries and he referred me to a party in the state of Nebraska, who he said was preparing scions, and I wrote to this man, and after a great deal of correspondence I got a lot of scions and grafted them, and I have found to my great regret that they are nothing in the world but the Old English Morello.

Mr. S. H. Marshall: Mr. Moyle says they have tried these trees in the station and they have not been successful. Well, I do not believe in condemning a fruit because it will not grow in one place; it should be tried on two or three other places. I do not think a trial of fruit in one particular location is worth anything; they may not do at all there, and they may do very well in other places. Now, I have plums in my orchard; right across the lake, within four miles of the University that do very well, that do not amount to anything on the other side of the lake, and vice versa. And I will answer Mr. Smith to say, as a member of the orchard committee for the last two years, that my objection to the Russian cherries was that I did not think they were as hardy as other varieties, and it has

been my experience on my own farm that they are very scant bearers. But I believe it is a good idea to plant some in some of our trial orchards.

Mr. Street: I noticed some of the plums died; were those Americana varieties, such as the Surprise, or Hammer?

The Secretary: Very few of the plums that died in any of our trial orchards, a very small percentage, some died in Eagle River, but we have planted many of the native varieties; we have not planted any Japanese or European plums in any of the orchards, with possibly an exceptional tree or two.

Mr. Street: Does the Surprise seem to be as hardy as the others?

Mr. Marshall: I think the Surprise is fully as hardy as any of the native plums.

Mr. Moyle: How about the Hammer?

Mr. Marshall: It seems that the Hammer is perfectly hardy; it is with me, I know, and bears lots of fruit, and the fruit, I think, next to the Surprise, is the best. The tree is very vigorous, and it almost comes up to the Surprise, it is one of the best things we have.

FRUIT MARKETING SESSION.

REPORT OF COMMITTEE ON CO-OPERATIVE FRUIT MARKETING.

W. H. HANCHETT.

As a member of the committee on co-operative fruit marketing I beg leave to report as follows:

Your committee as a whole have been unable to meet during the past year. As a member of it I have given the subject some thought, and as it has been my privilege to visit most of the fruit growing sections of Wisconsin, Minnesota, and Iowa, I have made inquiries regarding methods employed by the different associations I have come in contact with.

The following places that I have visited have associations: Eau Claire, La Crosse and Sparta, in Wisconsin; Long Lake and Excelsior in Minnesota; and Montrose, Iowa.

I found that methods varied greatly with different associations. The Sparta and Eau Claire associations seeking to look after the loading of the fruit only leaving the individual the greatest possible latitude as to how he was to pack his fruit and to whom he was to ship, while the Long Lake and Montrose associations practice some sort of grading and leave the marketing all to their manager, who is subject only to the board of directors; differing however in that while the Long Lake association aim to do their own wholesaling, avoiding the commission man as much as possible; while the Montrose association deal with the commission man solely. The question of commission man or no commission man seems to be a live topic where ever you find fruit growers.

The sentiment at Long Lake was decidedly against the commission man while at Montrose I found it just as decidedly in his favor.

Difference in location doubtless has a great influence in this matter. The community of fruit growers who have near markets are certainly not living up to their opportunities if they do not do their own wholesaling, while a community distant from its market making the refrigerator car a necessity must of a necessity look to the commission man as their distributor. The Long Lake association have amply proven that fruit growers through a well organized association may profitably do their own wholesaling; they having done during the past three years nearly \$200,000.00 worth of business at a cost of a little over 3% on gross sales, with something like \$600.00 of uncollected accounts on Jan. 1st, only \$100 of which was considered uncollectable. We wonder whether any commission house in the northwest can show a better record.

The Puyallup & Sumner association of Sumner, Washington, furnishes us with another example of enterprise and push on the part of an association. I found their blackberries last fall in every town in North Dakota in which the N. P. did business; shipped there by express in refrigerated crates, holding 72 quarts each.

Upon inquiry of a dealer at Valley City, I found these berries were often kept three or four days after their arrival in these crates in good condition. In a visit with Mr. Paulhamus, the

president of this association, I found he had visited all the leading centers of Minnesota, the Dakotas, and western Canada in search of markets for their fruit.

At Sparta no attempt has ever been made to place the entire marketing of the crop in the hands of a manager, our association only undertaking to look after the loading; leaving each individual to make his own bargain and ship to whom he pleased. I do not consider this the most business like way of doing but the great variety of soil about Sparta and the great variation in the quality of fruit make our growers very loth to pool their product, and a proper grading of the fruit would be the only way of making this possible. Secretary Crane field has asked me in giving this report to give my opinion as to the benefits of an association and as to whether or not a still further benefit might be derived by a co-operation between competing shipping points. That there is a benefit to be derived from co-operative work no one can doubt who has ever visited a fruit center during the fruit harvest. In fact it becomes a necessity. The loading of one or more cars of fruit calls for systematic work on the part of some one, and this means co-operation either organized or unorganized, and in every instance where I have made inquiry I have found that organized co-operation has obtained the best average price. I was surprised on a visit to Rock Island and Moline, Ill., to find raspberry growers there getting discouraged and quitting the business because the prices in their local markets had ruled at 6 quarts for a quarter for several years, this too, when markets easily within their reach were paying fancy prices. A little co-operation here and some pint boxes to have shipped their product in, would certainly have paid handsome dividends. The advantages of leaving the marketing of the crop entirely in the hands of an association manager are that it leaves the fruit grower at liberty to give his whole time at this critical period to look after the harvesting of his crop and does away with unnecessary competition. That there may also be a benefit derived from co-operation between competing shipping points I also believe, for in this way only can a more even distribution be accomplished and competition be reduced to a minimum.

To illustrate: On June 14th, the past season, a leading La Crosse commission house was flooding the west with postal card quotations, reading as follows; Nice Fresh Home Grown Straw-

berries \$.75 to \$1.00 per 16qt. case. They are coming nice now and we do not think they will be any lower this season. On this same date Minneapolis buyers were paying \$1.60 per case on the streets of Sparta.

I have understood that this commission house is the manager of the La Crosse association. What must the members of that association be doing to allow their manager to be selling their product in job lots when buyers were paying \$.50 to \$.75 per case more in spot cash for car lots within 30 miles of them?

A talk with Sparta that day would have saved them some money.

DISCUSSION.

Mr. Hanchett: I regret very much that the chairman of this committee could not have been with us; I believe he was the one who inspired the appointment of this committee and he and I could not agree in all points as to co-operative marketing of fruit. Mr. Hotchkiss was very enthusiastic in the idea that if the fruit growers should combine and establish salesrooms in all of our large cities, take the business entirely out of the hands of the commission men, that we would derive great benefit therefrom. I do not agree with him in that idea. While I believe it is a good thing for the fruit grower to keep close watch on the commission man and know whether or not he is doing a straight business, I fully realize that if we were to undertake to oust our commission men, that we will have a fight on our hands, that there would be some loss in this fight that somebody has got to shoulder, and in all kinds of co-operative fights I always find that those who are the loudest in proclaiming the benefits of co-operation are usually the last ones who want to put up the money or who want to stand expenses of any kind of a fight or any kind of a loss, and I do not think it is advisable or safe to undertake to suddenly upset any established methods of marketing. I believe that there are commission men who are just as honest and conscientious in the performance of their work as the average fruit grower, and for my part I feel that whatever is done in the way of co-operative marketing should be done in co-operation with reliable commission houses, as well as through co-operation on the part of fruit growers themselves.

Mr. Brackett: I would like to say one word in regard to this co-operation in selling fruit. I live at Excelsior, near Lake Minnetonka. We have an association there which we started without thirty members five years ago, and now we have about 145 members in the association. We ship nearly all our fruit through the association. Of course there are a few members there that ship their stuff to the commission houses, and I think it is very necessary that we have commission houses. There are times that we have more fruit than we can possibly dispose of through our regular channel of shipping to our customers through the association, and on such days as that it is necessary, we have to do it, we have to consign our fruit to the commission houses, and as this gentleman said, his paper was very thorough, he covered almost every point. There is one point he did not hit upon. We find in shipping fruits through the express companies that very often we have lost shipments,—may not have been delivered, may have been sent on the wrong road, and it is the fault of the express companies in doing so, but it is very hard to get anything out of the express companies if we have to go to them as an individual, it is a very hard job to do it, but through the manager of the association who is shipping all this fruit, when he goes to an express company for damages which he can prove, he does not have any trouble in getting repaid. We have had two instances of that kind at Excelsior. One time there was a lot of fruit sent through Minneapolis from our town, and through the neglect of the express company they allowed that fruit to lie twelve hours in Minneapolis before it went on. It caused us a damage of at least \$100. All our manager had to do was to present that to the express company, and without any delay they refunded the \$100, when, if it had been an individual, we might have fought them for a year and probably never would have got it.

MARKETING FRUIT.

A. L. HATCH, Sturgeon Bay, Wis.

There is a general impression that to keep well, fruit should be picked before it is fully matured. It is true that dead ripe fruit does not market well and soft fruit is at a discount in all markets. It is also true that some fruits like strawberries will color up and become apparently ripe in two days or less. With some fruits, notably the apple and peach, my observation and experience is that they keep best if fully grown and well colored when picked. Not only this but green fruit will never become of good quality and is often extremely poor. If you do not believe this try it on your Wealthy apples. No fruit can mature unless the tree or plant upon which it grows has good healthy foliage the entire growing season. Hence one necessity for spraying.

Another essential in marketing fruit is to prevent bruising. This means careful handling and transporting from the first to the last of the life of the fruit. It means taking the fruit directly from the plant or tree to the package in which it goes to market with the least possible handling. In apples I have already sorted as I picked and packed at once in the orchard. Of course I continue sorting all fruit as long as it is in sight, always throwing out imperfect fruits until the package is ready to cover.

In packages I have used barrels, bushel baskets and boxes for apples. For home market where packages can be returned bushel boxes are convenient and best, but for shipment I prefer barrels. For plums I know of nothing better than climax one-fifth bushel baskets with side slatted raised cover with slats set somewhat closer than for peaches. For cherries, blackberries, strawberries, gooseberries and currants I prefer the 16 quart Hallock crate with wooden boxes. For raspberries I use 24 pint Hallock crates.

Various kinds of paper boxes are now being exploited but I have seen more worthy of recommendation. Most of them are too flimsy and faulty in principle. A trial of one of these in shipment gave very poor results. There are now two firms in Wisconsin making birch veneer boxes that give excellent satis-

faction and we find them much stronger than white wood which was the original box material in Michigan and since its exhaustion there is obtained in Tennessee.

Where the quantity of fruit is greater than what is needed at home it is often necessary to combine with neighbors and load cars together in order to secure proper transportation and marketing. Where refrigeration and marketing is necessary as in the case of all berries and summer fruits it will be necessary to hire some one to receive, load and forward as well as to see to icing and fixing the cars. With us this person has acted as our salesman.

Of course where it can be done sales are made on the track but this can not always be done and then the salesman consigns to whoever he thinks best.

Where shipments are made over through routes between our great cities I think it would be a decided advantage to secure a private refrigerator car service as then better and cleaner cars can be had and expert inspection and care is given that will often be of great value to the shipper. If enough business is done to warrant the expense then it is advisable to have a man at the market end of the route to hustle for the shipper's interest.

(Where reasonable contracts can be made with reliable grocers and merchants and where deliveries can be made with reasonable certainty that method of marketing is usually satisfactory. But whatever method of marketing is adopted the shipper and grower should have telephone connection with their markets and have full information about their market at the latest possible moment before every shipment.)

DISCUSSION.

Mr. Geo. E. Rowe: This subject of marketing of fruit is so very large, and the phases of it that are of special interest, or that concern different states and different sections vary so greatly that I hardly knew which phases of it would be best to take up in connection with your meeting here.

I find in general that there are three things that enter into the marketing of fruit,—the man, the fruit and the market. Good man, good fruit, good market; poor man, poor fruit,

poor market, in general. The rule will not always follow out, but that is generally true.

My first experience in marketing dates back thirty-five years, when a boy, nine years of age, I used to go to market every day during the summer and hold the horses while my older brother went from house to house and hotel to hotel and took orders and delivered the goods, over at Grand Rapids. By-the-way, he was the first one to grow celery and sell celery in the state of Michigan, and think of the great industry that has developed since that time. I do not remember just when he began to sell it, before I had to hold the horses, I think. From that time until the time I was ten the next year when he went away, I had all of our goods to sell. We were among the first growers around the city, and that was the peddling of fruit from house to house, the grocery stores at that time did not handle green goods, they handled simply the old staples, but I think when I was about fourteen they had begun, a few of them, to handle strawberries and peaches and other classes of fruit. Then we found it would be easier to market a load by going directly to them and selling and taking the cash. My father with two other gentlemen, W. N. Cook and S. N. Pearsall were sent to the tri-state fair at St. Louis to represent the state of Michigan with a large collection of fruit. We having lived close to Grand Rapids market, always having had a good market and good prices, the fruit industry looked like a very fine thing.

At the tri-state fair at St. Louis we came in touch with the Iron Mountain Railroad people, and men representing the line of industry in Arkansas. They had lots of nice fruit there, and cheap land for sale and great inducements to offer, and father, with some others, thought it was a fine thing, and so in the course of a very short time we found ourselves in Arkansas, at the foot of the Ozark mountains, with a fruit farm, expecting of course the same good prices and the same good treatment from those to whom we sold our goods as we had in our home city, when we met the man to whom we sold face to face. But after we were established we found a very pleasant gentleman coming every day or two from the north or from Chicago and from St. Louis and from Kansas City, and all of them leaving their stencils and telling us and assuring us that they could give us the very best prices obtain-

able on the market for our goods. We planted heavily and we shipped heavily, and sometimes we got pay for our packages and sometimes we did not, and after a couple of years the bank account began to lessen that we had saved up and stored in the old home city, and it began to be another proposition. We attempted then, and did, organize a fruit growers' association. This proposition we came up against in our returns from the market, "Soft and sandy;" "berries arrived too late," "market glutted," and that of sort of thing constantly coming up, regardless of the condition and the time in which the goods were shipped. So then we came to the conclusion, after we organized the fruit growers' association, that in some places the express companies were perhaps to blame, because there were three express companies running over the same line, and all fighting for the business, and each express company could get into the market quickest. For example, getting into Des Moines, Iowa, or Cedar Rapids, every one could get there the quickest, and some of them would take 24 hours longer the way they went around, and so in those cases the express companies were to blame. But we found that the express companies and the commission men and the glutting of the markets, those three things, and the fruit growers said, now, we will have to investigate and find out, so as to know what markets will take our fruit. I happened to be the one that was elected secretary, and put on the road, and in 1886 I spent a day here in Madison, looking up your market to find out just what your capacity was. I visited many places, the size of Madison at that time, the largest cities in the Northwest, I visited in behalf of the fruit growers and shippers' association for the purpose of finding out what express company got in there first, for the purpose of finding out what commission man in that place was doing a square business, for the purpose of finding out how much goods the market would take, so that we could keep from overstocking the markets and could regulate our system of shipping so as not to get more berries in here than you could take, because, if they were good berries and you had five times as much as you could use you could not give anything for them; if they were good berries and you had the right amount, you could give a good price for them. Those three things we worked out along this line.

Each day all findings were printed and sent to every member of the Association, and those men did not get any more goods from that section, and they never knew why. They went down, they sent their men down, and they wanted goods and they never got them until they paid the cash for them.

I found the same sort of thing in Chicago. I found the same thing in every city where commission men are doing business. I found on the other hand again, that the express companies were to blame in some cases, and by-the-way, the express companies, when we appealed to them, told them what we had in mind, what we wanted of them, dealt fairly with us. The Superintendent of the United States Express Company at that time in St. Louis, said, "Mr. Rowe, we will do everything for you we can."

He gave me a letter of introduction, did not tell my business, but gave me a letter of introduction to any agent of their company, saying anything they could do for me would be appreciated by him, and gave me access to the express company's books. He gave me, on the other hand, transportation, an annual pass on any line that the express company ran on, or had any interest in, and the Pacific, United States and Southern, they all did the same thing, so that the matter of transportation and the matter of getting at the books so as to know just where the trouble was, was provided for by the express companies. They said, "This interest down here is our interest as well as it is yours, and we are willing to bear our part of the burden, to get at the best markets, and to find out what the trouble is," and in every case, where we made a report and a statement showing where goods had been delayed, and where the express company had been to blame for the delay, they paid the damage without any quibble about it at all. It was to their interest to do it. They were getting at that time through that fruit section, as long ago as that, they were getting 25 to 30 carloads of strawberries a day through that fruit belt.

I found, further, that the fruit growers were to blame in a great many cases. First of all, fruit growers, as a class,—I am now speaking of no particular organization, it is true of Michigan, it is true of every state in the Union, fruit growers, as a class, do not grade their fruit close enough, they are altogether too careless in the putting up of their goods, and

the commission men get a lot of goods on their hands that it is hard work for them to get expenses out of it, and they have got to make it up somewhere else; they have got to even things up. The fruit growers, as a class, do that sort of thing. I know of some of the very best growers whose goods in many cases are in a deplorable condition, even though they were fresh, when we go down further in the box. So that I recognize a lack of grading, poor sorting and poor grading of fruit has a whole lot to do with tempting or forcing or inducing the commission men to do the many things that he does. But because one man does wrong, that does not justify another.

But, I have found altogether, that the fruit growers are the hardest class of people to organize and hold together in any organization. While we organized and while every man through that section was benefited by its results, out of the over a thousand growers that were on that list, you could not get 100 of them that would put up \$5 apiece annually to bear the expense of getting the markets. They would not put up the money, they would not furnish a fund so that a man could be kept on the road, and so that the work could be organized and carried out; we found that out to be a familiar fact. Anyway, the disappointing conditions on account of the long distance to market and the inability to get the best returns from the commission men, induced us to sell our estate before everything was gone, and came back again to Michigan. After a few years I purchased an estate there and decided that it was absolutely necessary, in my own mind, to be in a position to have the buyer come to you, rather than you go to the buyer, and so we organized a Grand Rapids Fruit Growers' Association, composed of something over 500 members. We advertised. We sent out literature to 10,000, 15,000 and 20,000 dealers all over the country, with a picture of our market, and about what goods we had, and about when they would be ready. They would begin firing in letters, saying, "Ship the goods." We say, "We do not ship anything; we have the best in the world, you have got to come and get them. So, the first year we had 25 to 30 outside buyers, stayed there all the time, bought and shipped to their markets. Now, we have 100, sometimes 125 stop at the hotels at Grand Rapids, staying right there or arranging with some-

body to buy and ship to them, and we have found that that is the most satisfactory way of doing business. The Fruit Growers' Association at Grand Rapids does not do a single thing about growing or packing or co-operation or anything further than simply to advertise the market and get the buyers there. And they have Mr. Fisher, from Columbus, Ohio, who has bought on our market for two or three years, and he used to send two or three carloads a day, and he knows Mr. Jones and Mr. Harris and all those men that are lined up on the road, he knows what kind of goods they have got, and if you do not put up the right kind of goods, they do not sell them, and people soon find why their neighbors next to them can get \$1.25 for his peaches and they do not get 25 cents. "How do you account for his getting so much more?" "Well, they are the same size all the way through." "Well, I wonder if that does make it." Why, you could not induce him any other way to do better, except he saw the other fellow get the cash.

We have now, without any question at all, the largest wholesale market in the world, having sold from our market more than from any other single point; the Michigan Central has run out in one day as high as 175 to 200 carloads a day, and those goods are bought by outside people.

I know there are some good commission men, can't help but be, in so large an industry. I realize on one side they are hampered by poor stuff; they are bothered again because the growers do not know the quantity the market will contain, and the market is often glutted, and the express companies sometimes are slow, and they have their troubles, and they have their tales of woe, there is no question about it, but when a man does give them good, clean, honest straight goods, they are afraid to return it all to him, for fear they won't get a chance to get even again; they are just afraid to do it; they do not mean to be dishonest at all. I understand over in Milwaukee there are some pretty straight, clean commission men; I don't know just what their names are, but one of the oldest men in the country, S. M. Pearsall, years ago used to send everything he grew in the shape of apples to Milwaukee and he said he went over there and he found a man there that was absolutely honest and returned him every penny for his goods.

We have another friend who is shipping all his goods pretty

high grade goods, to Milwaukee. He has been over a number of times, knows where they go, and he gets a pretty good price for his goods. I think that he last year got \$4 a barrel for his apples, the year before \$6 from the same man, this year he is getting better than \$6, I understand, from the same man, for a large quantity of apples, but those apples are absolutely perfect, there are no worms in them, no blemish, absolutely perfect, and, of course, a commission man getting an absolutely perfect thing and a large quantity of them, he has to be pretty nearly square with that man.

So there are the problems that enter into this matter of marketing, from one end to the other, south to north, I have come to realize that they have got to be solved with each individual locality. A bunch of men that are gathered together, with good goods and a good man back of them, will command a good price in almost any market.

Mr. Goodman: I would like to say a little on the matter of co-operation and the marketing of fruit in packages that applies to Missouri, and I think it ought to apply to you people here just as much as it does to us. As friend Rowe said here, each locality must settle this matter for itself, and as Mr. Hanchett has said in his report in regard to the co-operative association, I find the same things occur in all parts of Missouri. We have quite a number, some fourteen or fifteen different co-operative associations down in Missouri, and some of them are carried on successfully and make good reports and get good returns and some of them are failures.

The main requisite in co-operative matters is to have, above all things, a good man at the head of the association, a man who will have the confidence of the fruit growers. As has been suggested, it is one of the hardest things to do, to get the fruit growers in one community—not in a large community like Grand Rapids, because they can be collected easier, but in smaller communities it is a hard thing to get the fruit growers to combine and to stand by what they promise to do when they begin, but if you do get them to agree to a thing, and stick to it, and then get a good man to handle that thing, he will always, without a single exception, he will always secure better results, better prices and get the things into the market better than any individual can under any circumstances. That is my opinion and that has been so all through our Missouri district.

We have gone another step farther now in the matter of co-operation. and have organized an association which will combine all these local associations. For instance, we have fourteen of the different local organizations, the different shipping associations combined together. Now, then, it is a mistake for this town and a town ten miles away and a town twenty or forty miles away all to ship a carload of strawberries to Minneapolis, or two carloads each. But this general organization is to keep track of the markets, and if they can find different markets for goods, to send one carload or two carloads to one place and another carload to another place, and so we find the matter of co-operation a very important matter in marketing our fruits to advantage.

A few years ago I thought that in Southern Missouri, in the Ozark regions, we would have to give up growing peaches and strawberries, because of the failure to secure markets, but since we have had these organizations we find that we have very little trouble if we have the right kind of a man to take hold of the business, one that will take all the shipment from a certain locality and handle them, we find we can get good returns, and, as has been suggested, you can always get the car of the railroad company, and always get the ear of the expressmen and get the ear of the commission men.

I want to say in regard to these commission men, that we have tested them and tried them in our co-operative matter for many years and we do find commission men in certain towns that are good, straight men and give us good returns, and we have two plans now of handling our fruit, and that has come about as the result of this co-operation. I am glad to know that Grand Rapids has taken that stand, that they will still have their stuff and have it for sale and sell it on the track and let people come and buy it. We have one or two or three locations in Missouri where we can do the same, but for the general public we find it is pretty hard to insist on that thing. We have in our plant ourselves let a whole carload go to waste on the tracks after it is packed and ready to ship, absolutely, because we could not get a buyer to take it, and we refused to ship it to any of the commission men that we have, and it was the cheapest way to lose it, too, but it brought the commission men down to this point now, so that we are sure to sell. We have buyers from Minneapolis and St. Paul down there, two or

three men that are buying all the time during the whole of the season, from the time strawberries begin running, and they are there through the peach season, and they listen to us now; when we have hundreds of car loads to ship it is something of an object to get them. Yet we do in certain instances have men in several of our larger cities and we will ship to them directly and they will take care of our shipments every time and they will give us about as good returns as will the buyers that come down and buy at our place, but these are exceptional cases. We have men in Denver, Omaha, Council Bluffs, St. Paul and Minneapolis and scattered through the North and West, and we ship to one man in that point and to one man only, and if we are sending to one commission man in that town, we will not sell to another commission man from that town either, and that protects our commission man and he will take care of us every time and no man can buy from us a carload of berries if we are sending that same day a carload of berries to a commission man who has handled our berries for six or seven years. It has come down to these points,—a good man at the head for handling it, good fruit, which we insist shall be graded, not like friend Rowe says, they are better organized up there in that regard, but we have here berries and peaches as they come in they are inspected and marked, and the inspector or handler of that business marks each grade "A," "Grade B," or "Grade C," and it has to go that way. If I bring in some fruit marked "Grade A," and he inspects it and finds it "Grade C," it goes out as "Grade C," and there is no appeal from it.

METHODS OF MARKETING FRUIT IN CALIFORNIA.

AUSTIN WALLINE, Upland, Cal.

The small amount of California fruit which first entered eastern markets had no competition with outside fruit, but as the industry developed, our fruit came into direct competition with Florida and foreign fruits. This required the overhauling of our market methods to meet these changed conditions.

Then, as now, the most serious problem which confronted the California grower was the question of freight. It required large sums of money to place our fruit on the eastern market.

As is usually the case, the fruit grower first tried the system of marketing through the commission man. While I do not wish to criticise the commission merchant, still his system of handling our fruit was not satisfactory. When prices on oranges were high, the commission firm boomed the orange market and everything moved along smoothly, on both the auction and f. o. b. basis; but the minute the orange market took a slump, these firms would boom some other commodity and either refuse to handle our fruit, or else sell at a loss to the shipper. This was no doubt very good business policy for the commission man, but rather unprofitable for the shipper. Since it is to the dealers' interest to rush fruit to the strong markets, it was no uncommon thing to have such a market quickly over-stocked, with the natural result—a slump in prices. Then was the time the commission man turned his back on the shipper. Since he did not own the fruit, he would not be held responsible, and generally left the shipper to suffer the losses due to the over-stocked market. The fruit industry was, to use a common expression, "All up in the air."

There was no general system of packing; everyone had his own system. A special brand did not stand for any particular grade of fruit. If the fruit was sold for cash on the trees, and the markets did not suit the buyer, it was usually allowed to decay without being paid for. If he sold (f. o. b.) free on board the cars at the highest eastern price, and the market meanwhile took a slump, the fruit would probably be rejected on pretense of being of inferior grade. If he sold at auction, he depended entirely on the tender mercies of the buyer and middleman, who could return money, or red ink. This was the condition of citrus marketing up to 1893.

In the month of August of this year a few prominent growers met in Los Angeles and organized themselves into the Southern California Fruit Growers' Exchange. The fruit exchange is organized as follows. In the first place there are the local packing houses. These are situated in convenient localities throughout the citrus belt. Associated with each one of these is a local exchange composed of the individual

growers of that community, controlled by a board of directors, elected from their own number. All these growers bring their fruit to the exchange packing house, where it is sorted, packed, and shipped. Each of these local exchanges belong to what is known as the district exchange. There are four or five of these local organizations in each district exchange. In the same way, thirteen district exchanges unite to form the central exchange, which has general control of the entire system. The district exchange has a manager and a board of directors, elected from the several local organizations, while the central is organized in the same way from the district exchanges. The principle underlying this system is that "Every member is entitled to furnish his pro rata of the fruit for shipment through his association, and every association to its pro rata of the various markets of the country. This principle reduced to actual practice gives every grower his fair share and the average price of all the markets throughout the year."

The business end of the proposition is as follows: There is the head office in Los Angeles and seventy-five branch offices scattered through the United States, Canada and Europe, through which orders are obtained for fruit, and through which offices delivery is made to the purchaser. Any adjustment for decay or poor quality being made by the local agents on the ground in the markets in which the fruit is sold. The matter of price is at all times controlled by the central office at Los Angeles. The preparing of fruit for the market and sale is controlled by the various exchanges and done at actual cost, which is determined at the end of the season. The money received for fruit is paid directly to the organization which furnishes the same. The funds to meet expenses are obtained by assessment from the various organizations, the basis for assessment being the number of boxes shipped.

During the first two years of its existence, the exchange marketed its fruit largely on the f. o. b. system. But they were soon taught that this could not survive, as in a single year \$100,000 worth of fruit was rejected or lost in the eastern market, in the manner I have already mentioned. On this account the system has changed to that of "selling delivered." In "selling delivered" the exchange establishes its own agencies at all principal points of distribution. The fruit is sent to them direct and sold on the spot for the highest

market price. The advantages of this system are many: (1) it allows the selling for the highest market price; (2) cars can be re-routed on the way east, which removes the chances of a glut in one market at the expense of another, since a car can be diverted from its original destination and sent to another city; (3) the fruit is sold to the buyer on inspection, which guarantees satisfaction, since both parties are present and adjustment can be made; (4) the constant development of new markets and better distribution of the produce. Since the eastern agents specialize in citrus fruits, it is to their interests to enter new fields, boom the fruit, and bring about the largest possible area of distribution.

What has been the benefit of this exchange system to the grower? It takes off his hands the responsibility of selling, packing, and shipping, with the result that the cost of marketing has been reduced from sixty-five cents per box, to less than thirty-five cents. This is made possible by having the smaller packing houses combined in one larger one. The packing supplies are bought in lump lots for the whole system. In the second place the grower is protected, in a large measure, against the transportation companies from losses either in wreck or through negligence in caring for the car during transit. Since 1893, with the exception of one year when our fruit was not first quality, we have received prices which made orange growing profitable to the ordinary rancher, which is more than can be said of the period before that time.

The exchange last year sold for the growers about 48 per cent of the entire crop of oranges and lemons, or about 14,000 carloads of fruit. The remainder of the crop was marketed by independent packers and commission men. While some growers are able to do better by selling for themselves, yet in general it is safe to say that the orange industry owes its strong foundation to the exchange system, since it not only takes care of the growers who belong to the exchange, but it compels the cash buyer, who still remains in the field, to pay a price equal to that which exchange growers receive.

While the plan which I have outlined applies more especially to oranges and lemons, still it is gradually spreading out so as to include co-operative marketing of other produce, such as apples, small fruits, celery and potatoes. The development of the Hood River Valley in Oregon owes its great success largely

to the co-operative exchange system of marketing. In handling their strawberry crop, there was \$30,000 more net profit to the grower last year than ever before. Ninety per cent of the apple crop is sold through one central agency, which sees to the grading and marketing of the fruit. The Hood River Valley is only one of the numerous instances which could be mentioned where successful exchange marketing has been practiced.

Unfortunately I was not present to hear the discussion upon this question of Co-operative Fruit Marketing as presented earlier in the program, among the fruit growers of this state. However, it seems to me that there is here in Wisconsin a field for such a system. Large sections which are engaged in the growing of small fruits or vegetables should be organized into co-operative districts. Have the produce graded and of even pack. Have each member bring his produce up to a required grade. By selling produce of a high grade from any district, that section will soon develop a special market, which will offer a fancy price. Each district can have its own agent, who will bring the special brand under which the fruit of that community is marketed, and only that brand, before the public for sale. Co-operation pays and we are in the business for the dollars and cents we can get out of it, so why not co-operate?

MARKETING FRUIT.

(Prepared by James Handly, Quincy, Ill., but not delivered at Convention.)

The subject assigned to me is far reaching, disclosing greater depths than it would be possible to fathom in one discourse, and ranging in unlimited fields that could not be encompassed in all bearings in a short address. In my immediate vicinity in Illinois, there seem to be no special organization among fruit growers for the purpose of directing best methods of marketing. Each fruit grower has an independent way of thinking and acting, striving to reach the best results from following his theories. I have been something more than a casual

observer, however, on the systems of marketing fruit in regions quite beyond the boundaries of my own neighborhood. In an effort to get the best practical ideas of fruit growers who have scored a commendable success in marketing products, I recently wrote to several engaged in the business, and I beg leave to submit some of their replies:

P. E. Goodrich, of Cobden, Ill., says: "In reply to yours of January 16, asking for information relative to the marketing of fruit, permit me to say, that in my own town we have a regularly incorporated shipping association, whose manager's business is to make contracts with railroad, and to secure the number and kind of cars required by shippers. If in winter, for shipping sweet potatoes, first, the cars required in a daily supply are placed on side tracks ready to receive the barrels. If in summer, and ice cars are needed, he procures them, and has them charged with ice, ready for use.

The manager collects information as to markets and prices, receives fruit at the cars, receipting to the owner for the same, assists in the placing of fruit properly in the car, makes a manifest for each owner, and builds a car consigning it to the proper person at its destination. We get the best rates and service in this way, because the cars are shipped from one person to one person, and this relieves the railroad of all clerical work, and the labor of loading and unloading the cars.

The freight is collected by the manager at place of consignment from a shipper's commission house, receiving it, and paid to the railroad in one amount, as per the whole number of cars received on one date, thus relieving the railroad of the trouble and expense of collection. Our association now ships, during the fruit season, from fifteen to twenty cars daily, which amounts to many thousands of packages; thus it will be readily seen that a very competent and systematic plan of shipping is absolutely necessary."

E. H. Shepard, Manager of the Hood River Apple Growers' Union, at Hood River, Ore., under date of January 26, writes to me as follows: "I regret to say that I have nothing to offer in the way of a printed circular along lines of information you seek. We attribute our success largely to association work. In the first place, in order to get the best results, I believe that selling f. o. b. is one of the necessities, but in order to sell this way, he must control the situation. To do this, you must or-

ganize an association; having done this, it is also necessary to bind your growers to market their fruit with the association, and this must be done by a regular contract signed by each grower; having done this, the next step is to educate your people to grow good fruit, and certainly to insist that they furnish first class fruit, leaving out culls. This is really the gist of the whole matter, and in these few sentences I have covered what might be elaborated upon to the extent of several pages. You know what is good fruit probably a good deal better than I can tell you; see that they put it up right, and this covers the whole subject."

J. Fowler of Upper Alton, Ill., who was an eminently successful orchardist and apple packer in Calhoun Co., Ill., for twenty years, gives the following observations: "Referring to the matter of marketing fruit, perhaps you are already in possession of better information and data than I could suggest. I have tried to find out how to get the best market results in various ways; have consigned to various commission houses, and this method cost me thousands of dollars, owing to short returns; have sold to be paid for on arrival, and this is bad, as the average dealer or commission house will turn your car of fruit down on the arrival, providing the market was a little off, and wire that the car has arrived, fruit not of condition and subject to your order, and turn the rejected car to some other house, and of course, it has a good excuse for slaughtering this rejected car of fruit, and then we might be called upon to pay freight and other incidental expenses. Now I have had some good success in consigning fruit, but it is not the rule. The grower that consigns the fruit, that is, as a rule, holds the bag all the time. He takes all the risk and worry, and cost and growing, picking, packing and shipping, and the great risk and worry over what the commission house will return to him; and if anybody gets hurt in the deal, it is the producer or shipper. The most satisfactory way for the producer is to sell at home, either in bulk, in orchard, or by the barrel, packed and settled for on the spot the producer should sell an honest barrel of apples, and then pack an honest barrel of apples. I could say more or less about the system of packing and grading fruit that does not exist in the practical work of many growers, and this is somewhat against them. There are lots of growers who refuse to pack an honest barrel of apples, as well as a lot of com-

mission houses who refuse to make an honest return of sales. Erb of Memphis says that he is a grower as well as a commission merchant, and he favors consigning, but his suggestion falls very flat with us, because Erb is in the commission business. Buy and sell apples, and let each one take his own risk for results. Much could be said about producers reading up, and being posted on general conditions, so that they can sell their fruit intelligently, and get what it is worth."

The following extract is from a letter received from Major C. C. Bell, secretary of the Central Missouri Horticultural Association, and who is well known as a national figure in the horticultural work in its various departments: "Referring to marketing fruit, will say, that I can only look at the business as a whole, and suggest ways which from my personal experience is for the betterment of the business, and which I will look upon in a way far different from a contracted point of view. I want better quality, more careful assorting and handling and honest packing. When this is done, in fact, and not in words, then a paying price will always follow.

I am, and always have been a great believer of specialties, and I think if this is followed in the fruit business, those engaged in it will make more money. Perhaps the first important question in varieties of fruit is to consider the location of the land, its quality and position for market. Strawberries may pay big on land worth 100 dollars, or more per acre in some good position for market, while they would be a failure on the same sort of land only costing 10 dollars per acre, not well located to a market; this holds good for all fruits, but more especially for the most perishable fruit.

As stated, I believe in specialties, and hence, think that the grower should not try to be a dealer, speculator, as in the long run, such methods would cause him to lose money. The nature of all business requires that it should be well done, with experience, capital and tact of application; and we can only be a link in the chain of commerce, and never the whole chain. To be a jack of all trades at this time and age, as a rule, is failure; and what we want is success.

To be truly successful we must be broad and big in our views, and this is especially true in business, and on this point every farmer has much to learn yet. To illustrate, I call to mind an apple grower living in my neighborhood, who had a very

fair crop of apples, attracting many buyers, and who, on account of both quantity and quality, had run their offers up high, and to the point where no margin for profit was left; and yet this apple grower in the face of the market, and not sell, but held out for higher terms, dragging along until the buyers withdrew, as some of his varieties are ripe and ready to go into cold storage when they should have been in shape with barrels on the ground to pack. The result was, he was left with a lot of apples, some too ripe for good packing without a buyer; he had to undertake to pack and ship for himself, and by the time he secured barrels and packed with farm hands, and loaded on cars, he then tried to sell to buyers, but the best of buyers did not care to take them in that shape, and so days, and I am informed weeks, passed in this delay, and I was creditably informed that he did not get one half as much in the end as he would have had for the apples while they were on trees. My advice, therefore, has always been to both growers and speculators to sell whenever you have margin and do not begrudge a little profit the one who buys may make."

C. M. Gerard, Secretary of the Eastern Illinois Fruit Growers association, writes to me from Charleston, Ill. as follows: "The object of our association is to prevent each grower from going to our local retail dealers, and allowing him to establish a price by quoting something that came to him by hearsay in regard to the price of fruit. Secondly, to keep in touch with the shipping trade, and thus prevent a surplus of fruit at home. Our members received the same price for the same grade of fruit, and by selling under our direction they received an advance of 25 per cent above the prevailing wholesale rates. Our object is, to include all kinds of fruit when the fruit growers are willing to bear a pro rata expense of a salesman, both local and traveling, when necessary to dispose of fruit to the best advantage. We are perfectly satisfied with the success of our association thus far."

G. A. Atwood, of Springfield, Mo., secretary of the Ozark Fruit Growers' Association, says in a letter that was a little delayed:

Please excuse delay in replying to your favor of last month. I have been and am exceedingly busy. I have been to several

of the northern markets as far as St. Paul, and the office work here is getting to be large. The objects and aims of the Ozark Fruit Growers' Association are partially set forth in a circular I send in another envelope, the only copy I have left. We shipped 525 cars of strawberries last season from central headquarters, Fayetteville, Ark., and later at Monett, Mo. We made more money for these local unions than some of them ever made before. Expect to do a larger and more successful business the coming season. The system is simple, safe and inexpensive.

Manager and secretary have modest salaries. We have agents in the principal markets during our shipping season. A large proportion of cars are sold on track. We expect to sell 1000 cars of peaches this season if there is a fair crop. With telegraph and long distance phone the manager at central office can dispose of cars just as readily as if the cars were before him and buyer.

Without some system in marketing berries and peaches, these berries and peaches would not pay expenses. And we shall have to use system in marketing apples.

Before the recent cold spell we had the fruit buds for 1,100 or 1,200 cars of berries, 2,500 cars of peaches and 8,000 cars of apples. Peaches have been badly killed in some sections. Between Springfield and Koshkonong there are enough live buds for a full crop.

Success to you in co-operation.

Not wishing to come before an intelligent body of growers and shippers with finely spun theories, I have availed myself of the opportunity of presenting views, and also giving experiences of some of the most practical fruit growers and packers selected from a widely extended acquaintance. At the present meeting, as well as in many others held to discuss practical points along horticultural lines, we repeat ourselves, and repeat remarks frequently made by others. Perhaps it is quite proper that this should be so, as it causes a continuous stirring of soil, which may need a continuous repetition in sowing some of the best seeds of thought which may require constant application before they take root, and are finally in shape to produce satisfactory results. In order to market fruit successfully, I would require the man entering upon the business as a grower that he should be interested in his work

to the extent that his vocation would always be an inspiration; he also should be eminently fitted for carrying on his work successfully. It is a sad fact that too many of the failures in life are frequently caused by men widely missing their calling. We have some farmers who would make good statesmen, and would be capable of shining in many professions. We also have many preachers who would be rendering better service to the world if they followed a plough or managed a commission house, and who would try to place bounds on the success that some commission men would achieve if they were filling the place of some preachers. Some time ago, I asked an acquaintance living in Missouri why he destroyed his orchard. His reply was, that the growing of fruit ceased to interest him. The whole bent of his inclinations resolved itself in efforts to grow fine and fancy stock, and while giving this an undivided attention, his orchard suffered, and rather than have an eye sore on his premises he put the orchard out of existence. I surely think his good sense should be commended. It is a fiat of fate that there is no excellence without great labor, and we must have an unlimited amount of patience and perseverance, and perfect willingness to stand some dreary drudgery to accomplish desirable ends we have in view.

Too much judgment could not be applied in selecting the right quality of land for growing fruit. I know of land in the middle west that would grow 100 bushels of corn to the acre, and yet, would not be worth consideration for orchard purposes, as it lacks essential elements for fruit growing. If the grower must have cheap land far away from railroads, such land should be selected with a moral certainty that shipping facilities will become contiguous as the orchard develops in passing years. Emerson said that the education of a child should begin before it is born. The fruit grower should feel a full responsibility of proper caring for his trees in their young and tender condition. They may receive injuries at this critical period, which, while they may not destroy life, may leave blights, that will greatly affect their usefulness through all periods of existence. I think that the fruit grower should be very familiar with all the component parts of the soil, and should be ready at all times to make good the drafts for sustenance of growing trees, and, remembering

that wood and fruit are composed of distinct element, he should not forget to freely use a fertilizer that will furnish the food required for the fruit.

The attention trees received with each passing year affects their future for all time. If an orchardist neglects his trees for two or three years, or even one year, he can not, and should not, expect that extra care in the future would repair losses by indifference in the past. Again and again it must be impressed upon the apple grower to do his best in efforts to grow the finest fruit. We are living in an age of progress, and the quality of fruit growing half a century ago should be something out of date at the present time; and it is quite probable that the apples grown today will not compare in quality with the apples to be produced a half a century, or perhaps even a quarter of a century in the future. In the early days of stock growing, the average weight of an ox was 400 pounds; a sheep, 50 pounds; a horse, 600 pounds; a cow, 250 pounds. Note the developments in the paths of progress in these pursuits. Now we frequently see an ox that will weigh 2000 pounds; a sheep, weighing 400 to 500 pounds; and a cow, weighing from 1,000 to 1,500 pounds; instead of the diminutive horse, we now have horses weighing from 1,000 to 2,000 pounds. These facts seem almost like wonders that have been accomplished by evolution. The development of fruit shows also a splendid record. Starting with a poor, insignificant Siberian crab apple, a constant development unfolding through centuries now gives us the beautiful bell-flower, the Jonathan, Grimes Golden, and many scores of splendid varieties of apples, by no means excepting the much abused and much complimented Ben Davis. We can observe the gain and learn other processes of change. Starting with the common sun-flower we now see that crowning beauty, the chrysanthemum. The avenues to further opportunities for developing fruit, as well as all other products, are wide open to the earnest seeker. In the early days of emigration to Alaska, it was noted that the natives in that cold climate put on their furs, and hovered over fires, made from faggots, with a perfect unconsciousness of the rich inexhaustible coal mines not far beneath the surface of their daily walks. It would seem that too many are in the departments of horticulture with the same unconsciousness of what might be accomplished if they only used the foresight and the

necessary persistent endeavor to reach results. It always takes a reasonable effort on our part to accomplish our purpose.

Referring again to the work of marketing fruit, taking it for granted that the orchardist would pack nothing but good fruit, it is quite apparent that the best results in making sales in neighborhoods not exactly convenient to market would be by forming fruit associations along lines as indicated by letters that I have read. In cases where the apple grower does not care for the labor of sorting his fruit, it would seem to be better for him to sell his orchard in a lump to the buyer, and let him do his own sorting. On the other hand, if the grower understands all conditions, and is willing to meet all requirements, the buyer, nine times out of ten, would be willing to pay an extra price for the fruit if the grower would do the sorting and packing. The movement on the part of commission men in buying orchards in a lump was started solely for the reason that the packing of the growers in too many instances was unsatisfactory; and, no doubt, most of them would be willing to again buy by the barrel—when the packing necessary is assured satisfactory sales are assured. It must be borne in mind that apples should be placed in cold storage quickly as possible when picked. If an apple grower should have his own storage house, he should be careful to pack the apples so well that they will need no repacking when shipped for market. If he has no cold storage, and the apples are not sold, he should make all possible haste to place the fruit in the nearest cold storage house. A friend of mine in Illinois, who buys largely apples of New York orchards, recently told me that he had made some very serious mistakes by shipping the apples to Illinois instead of placing them in cold storage at once in New York. As a rule, at the time of apple harvests there is a great rush in the shipping of apples, and it is sometimes very difficult to get car service, and, as a consequence, this delay in taking care of the fruit inflicts injuries which have a most telling effect in decay and rotting later in the season. When apples are well secured in a cold storage house they can be taken out at the owner's pleasure, and shipped at times when there is a lack of fierce competition in securing car service. To the retailer, who hauls apples to town in boxes and baskets, it is essentially necessary to put his fruit in clean packages. There is a marked change in the exhibition of apples when they are taken from dirty baskets and musty boxes, and placed in packages that are bright, fresh and clean. The old saying, not how much, but how

good, is a good motto in growing fruit for market. We all know that fine fancy apples will frequently sell from six dollars to ten dollars per barrel, when the poorest qualities would be a drug on the market at one dollar per barrel. It certainly would be less trouble to handle ten barrels of apples worth 100 dollars than 100 barrels worth the same amount. There need be no needless fears or anxieties of any character of disposing of a crop of the best apples that can be produced. In early days, before railroads to the Pacific were constructed, did it seem a hardship to men to cross what was then known as the American plains, and put up with all manner of privations and their determined efforts to dig gold from the mountains? And, again, how cheerfully men have braved the perils of the sea the violence of enemies, and all sickness and dangers contingent to foreign countries in search for the diamonds that have been found in Australia and darkest Africa. It can be depended upon with the most reasonable assurance that wherever, and whenever first class fruits are produced, some enterprising buyer will discover the scent, and trace the trail until the price is secured. There is no question but that horticulture is in its infancy. It will require much research, the closest observations, and earnest attention to push it forward to its proper place before the people, but the strong union of effort, which comes from an increasing interest and added strength of horticultural societies all over the country—strives in development will be made with each passing year. The outlook is ample. It should be impressed, however, upon all the workers of the present age that they must be on the alert, be ready to recognize their opportunities and to take advantages, which will keep them fully abreast of the times. Wonderful, indeed, are the changes in the paths of progress during the past quarter of a century. Electricity has been enthroned in its power, giving support to millions of people in lucrative employment, and other changes of equal importance in the vast machinery of the world have been made, and we can readily see that millions and millions of people who are not now, and never will be fruit producers must be provided for by the foresight and industry of horticulturists. Great are the changes and conveniences made for the benefit of fruit growers in the past comparatively few years. Foreign markets have opened to receive large quantities of surplus crops; cold storage plants have come to the rescue to take good care of the crop while waiting for satisfactory market. There is a marked improvement in all

kinds of orchard implements and on hand tools. A noted progress in the methods of fertilizing and spraying, and always clearer and clearer views into the science of fruit growing; the iced cars for handling fruit when it is necessary, and countless advantages to all in the present age which were unknown and unheard of by the pioneers of the fruit industry.

Let us all in our day act well our part in efforts to reach higher degrees of perfection with a confidence of reaping a merited reward of having been useful in our time, of elevating the fruit industry to a higher standard, contributing measurably to prosperity in commercial circles, and in enhancing the happiness of many rural homes in which are engendered and fostered the true principles which give the strongest protection to the good order of state and national government.

DISCUSSION.

The President: I am sorry there is nobody here to stand up for the poor commission men.

The Secretary: Mr. President, I do not propose to stand up for the commission men; I am sure if there were any representatives of the species here they would be able to stand up for themselves. I had a promise from Mr. Sieg of Milwaukee to be here and the next I heard from him was from Honduras, that is somewhere down in the vicinity of the Equator and he recommended to me another man who is well able to present the subject and shortly after I had a letter from him from New Orleans, that he was on his way still farther south. Then I despatched a letter to a man in Duluth, Mr. Ferguson, whom some of you know, who, it was said, would be able to represent the commission man, and not long after I received a letter from him from somewhere in Alabama or Georgia, somewhere in that region, saying that he was on his way still farther south and so this society seems to have frightened these commission men away. But, joking aside, those men have business in the south at this time of the year for the purchase of tropical fruits, business meetings and that sort of thing. They wanted to come and they are very much interested and they hoped to be able to be here to speak on this subject. I had a very interesting letter from Mr. Sieg of

Milwaukee, saying that he hoped he could come. He brought out this point, that the word "commission man" should no longer be used because he said the progressive, up-to-date man wished to be known as a fruit and produce dealer; that he sent his agents out and contracted the crops, knew just where his fruit was coming from and did not depend on daily shipments on commission. I regret I was not here during the discussion, but in the past years there has been a tendency on the part of many of our fruit men to class all commission men, without distinction, as being robbers, and I have had that view, had absorbed it, and held to it pretty strongly until I came in contact with commission men and talked with them, without telling them all my business, and I was greatly surprised to find out that they were not all robbers and I would send to them without reserve any fruit that I might have without fear. They have things to contend with as well as the growers and while there may be rascals among them, as a rule, they mean to do right, because it is to their interest to do right.

Mr. Street: It is generally supposed that commission men will go to a hot climate anyway and there is no need of their being in a hurry about it, but I do not want to see the commission man exterminated too quickly. I find it is very handy when I have sold all the fruit I can sell and have a big surplus, some days fifty or one hundred cases, to have a place to put them and I should hate to see the commission man put out of business.

Mr. Toole: I am glad that the discussion took the turn that our President and our Secretary have given it in favor of the commission man, because it very seldom does. Last year we went after the commission men very hard and there was not much said for them, but I have listened and in all that has been said in these different papers in regard to marketing, a strong point was always made in favor of good goods, and I do not think you could rejoice the heart of the commission man more than by producing a first class article and packing it in a good, honest way. He is then in a position to do well by us and to make a profit for himself, and by helping ourselves we help him.

Mr. Hanchett: Since I have been in the fruit business it has been my privilege to become quite intimately acquainted

with some commission men, and I have been brought to realize that the commission man is always between two fires. He is the purchaser on one hand and the retailer on the other, and I had this very forcibly brought home to me one day in St. Paul; I was in the market there and I saw some strawberries brought in to a commission man; I was well acquainted with him and stopped and talked with him and examined them, and they were very small, poor strawberries, little Warfields that were almost all calyx, not much berry; calyx and sand is what they were made up of. The commission man was an Irishman and he had a rich Irish brogue, and he said to me, "I don't see what people are thinking of by sending such things on the market, they are hard to get rid of at any price." Just then a groceryman came up and stopped to talk berries. Mr. Commission Man stepped up promptly, and he said, "They are small, but I have always been told that small berries are the sweetest, and I actually believe they will make more fruit to the quart than the big berries." Now, it is true that there is a class of sharks who are going around like the roaring lion seeking whom they may devour, in the guise of a commission man; I have been sharked out of \$300 or \$400 by that class of man, but that was when I was cutting my eye teeth. We are troubled greatly in Sparta with this class of commission man. We have become so well acquainted with the commission man on the market with which we do business that we think we understand something as to who the reliable men are. It is one of the points of our association to try and protect our members against unreliable commission houses, but when a soliciting man of one of these swindling concerns visits our city, he always succeeds in getting quite a haul. He will perhaps first go to our board of directors and ask to be made an agent. Being refused, he goes out among our members and he slyly whispers in their ear that he wanted to become an agent, "But that board of directors you have got there, their price was so high, I could not buy of them, and they are getting a rake-off from you fellows by not letting me in." And of course he goes talking around the back street, and runs down the association officers and gets some men to ship him fruit, and the first fellow that sends a good price, and that proves that the board of directors are getting a rake-off, and then a whole lot send in some more, and that is the last that is heard of that commission house.

Mr. Goodman: Make those very men that do that pay a fine

of \$50 or \$25, just bring them right to time; if you have the right kind of an organization you can hold them. You can never ship to a commission man some surplus that you have to dispose of, he will never give you satisfaction that way. But you send to a commission man every day, and he knows that you are going to send that way and he will take care of your shipments. But if you sell all you can sell in your own way and send to the commission man only something that you cannot handle, I don't blame him very much if he gets the best of you. But the very men that agree to stand by your co-operative association will be the first to sneak off and sell to some other man, and if you can get tab on them, have rules and regulations and fine them if they make a shipment of one box to any one except the association.

Prof. Henry: I was not here when the paper was before you, but I wish to add my testimony to the great prominence of co-operation in all parts of Europe, and its incipient growth in this country. It is starting, and it should have every encouragement from our people. We all know the force of numbers; we all know how one man is nothing by himself, but a dozen men combined for one purpose accomplish a great deal. We can see that in other directions, in all lines of activity. In Europe it is marvelous to see the results of co-operation; men are co-operating in all possible lines to the good of those that are working together, and I want to see in the state of Wisconsin, now that our people have reached a certain stage of intelligence, that we have gotten to a certain stage of production, an intelligent handling of that which is produced.

The Paris fruits are sold at auction under the co-operative system; in Denmark, where the production is not horticultural in its nature, but where they produce pork and dairy products, and eggs, nearly all that product is sold under a co-operative system and the results are simply marvelous. The eggs are handled with the greatest skill, and they are sold to the customers from the four grades. All eggs are perfectly clean and actually have on them the stamp of the syndicate, as they call it, the local syndicate, and the number of individuals in that syndicate, and the date that the egg is laid, and little Denmark, one-quarter as large as Wisconsin, is now shipping 20,000,000 eggs and actually buying corn in Nebraska to help produce those eggs. The United States does not export any. We boast of our American products; our cotton, our wheat, our corn—all

the immense beef product and so on aggregates in total value \$11 for every man, woman and child in America; the United States sends out \$11 worth of horticultural products, cotton, beef, wheat, corn and oats, now, don't forget that when we speak of our boasted production in America, little Denmark, one-quarter as large as Wisconsin, and as many people, with poor land and good land mixed sends out \$33 for every man, woman and child in agricultural products, and she has done it through co-operation. We sit here and whine about the trusts and we boast about our intelligence and our freedom, and little Denmark that has over 50 pork packing establishments carried on by the farmers sends her pork into all the European countries, and the Armours and Swifts have tried to drive them out of the market, because they ship to the same markets that they do, and the Danish farmer is not afraid of the whole combine. Now, why cannot we co-operate here in Wisconsin, the horticulturists and the pork producers, all the people? We have intelligence and markets and opportunities.

The President: We have with us a man who is known to every one of you, by reputation at least; he is too modest to come forward and introduce himself, and I would like to have the members see this gentleman before we leave, and that is Mr. Matthew Crawford.

Mr. Crawford: Mr. President, I am not so much interested in this matter of marketing as I am in some other branches. The fact that impressed me was what this gentleman said about having something that was worth marketing, that was well graded and well packed, and that brought something to my mind that occurred a long time ago, when I was a young man working for my employer near Cleveland. We had a little dwarf pear orchard, and he took it into his head that he would buy a lot of bones, and he put an advertisement in the paper and bought tons and tons of bones, and they were all stored in this dwarf pear orchard, piled in perhaps three feet deep and there were a great many of them until he was ready to crush them. Well, of course, these bones lying there gave a great deal of fertility to the land, and there was no damage to the roots, they came up near the surface just where they wanted to, and such pears as were produced there were probably never carried into Cleveland before nor since. He took a lot of them in to his son who kept a store and his son said, "Father, what will I ask for these pears?" "About 25 cents apiece." "Oh, I can never get that."

"Well, if you can't, I will take them home again." My employer had some business around the city, was gone two or three hours and had to call at the store on his way home and they were all gone except perhaps half a dozen of them, all sold for 25 cents apiece. Now, they don't pay 25 cents apiece for pears in Cleveland, they don't pay any more there than they do anywhere else, but these pears were twice as nice as any others, and if he had asked 50 cents apiece I suppose he would have sold them.

Another experience I will give from the same man. He had six acres of red raspberries when I worked for him, and he picked as many as 60 bushels in a day, took them in and his son sold them. Every Saturday he would go in and get several hundred dollars to pay the help on the farm. He had about 100 acres which is near the center of the city now, but he had from 15 to 30 women and boys and he needed a great deal of money, and he got \$200 or \$300 a week for help. At the close of the strawberry season he thought that he had received about all of his money, and still he thought he had not got very much. The next Sunday after that his son and his wife came out to take dinner with the father; after dinner he said, "Father, I have \$1,000 raspberry money for you," and Mr. Lloyd was very much surprised, and after he got through expressing his surprise, his daughter said, "Well, father, I have \$1,000 raspberry money for you too." So he had \$2,000 from six acres more than he had expected he was going to get, but I can assure you that everything he did there was done right, everything was raised the very best and graded and marketed in the best style, and it has done me good all my life to think that I spent two years with that man when I was a boy.

Mr. W. H. Webb: I have been greatly impressed with the subject of co-operation, but underlying it I see one principle that has been brought out by nearly every speaker. It is not a question affecting primarily state horticulture as to marketing of berries but it is simply one of character, simply honesty underlying the whole problem. I have a little sympathy with the commission man, as I do with the under dog when he is pounded on, whether he is in the right or wrong, as a rule, and I do not think all of the dishonest men are in the commission houses handling fruit. The Secretary spoke of the honest commission man from Milwaukee who did not want to be named a commission man, namely, he wanted to be a produce dealer. He after-

wards named a man from Duluth that he hoped to get here, he also had taken to the south, Mr. Ferguson. I happened to know Mr. Ferguson, he went into the commission business because he was a producer; he was a farmer, a vegetable grower, a small fruit grower, a thoroughly honest Scotchman and he made both ends work. He did his own selling and he made so much of a success of it in that line himself that everybody else wanted to sell to Mr. Ferguson, and they got a square deal. But the main point in co-operation is that honest men may meet other honest men and find out the dishonest men and when we have done that we have solved the whole question, in my opinion.

Prof. Henry: I quite agree with that, that that solves it all. When you try to buy your boxes, when you try to get rates on the railroad, when you try to reach the consumer, make no mistakes about it, you need a central organization, you need an organization that telegraphs from Philadelphia, "Do not send any strawberries here, keep your shipments, we are flooded." You need an organization to tell you how to put it there, when to put it there; you need, when you buy your berry boxes, to buy them of such quality and price as to have the kind that the market wants. You need a thousand facts regarding your business that as a company, as a corporation, you can get, and you cannot do that when you stand alone. You have got to co-operate in one form or another. I met some gentlemen a short time ago in the city of Columbus, Ohio, and they said to me, "We represent 10,000 Italian farmers, we are here to buy agricultural machinery; we have come from Springfield, Ohio, where we have inspected the horticultural machinery and making our contracts, we will now go to certain other points; we represent 10,000 parties in Italy and we are buying horticultural machinery for them.

One reason why the English farmer is in such a deplorable position today is his "independence." If you rub up against the English farmer you will find him the finest gentleman. They have been the greatest farmers and independence has helped them to that, but they have got to compete now with people weaker in many ways, but people that stand together, and the poor English farmer today is one of the greatest sufferers. We have the Dutch farmer, the French farmer and Hungarian farmer. they are making their own markets and are in better condition, not because they are as good farmers as he is, as a rule, but because he is independent, he is proud of his independ-

ence. Now, my frineds, we have got to get together, that is all there is about it. You cannot farm on land in Wisconsin, cannot produce the best results, until you have cut out the expenses that are not necessary and you have such control of your markets, such arrangements that you can get your products marketed to the best advantage. Now, co-operation does not always mean putting up the prices, but it means cutting out the expenses, and we have learned too much of the benefits of standing together to see co-operation lag at this time.

WEDNESDAY—AFTERNOON SESSION.

STRAWBERRY REVIEW FOR 1905.

W. H. HANCHETT.

The strawberry crop for 1905 in the vicinity of Sparta was the most unsatisfactory crop harvested in several years. Yields were very small and quality very poor. Many theories were advanced as to the cause of the crop failure by different growers. The roots of the plants early in the season were bright and in an apparently healthy condition, showing no signs of winter killing. Later in the season they were found to be dead and rotting.

It has been customary to attribute this root killing of strawberries to winter killing, but our experience the past season seems to indicate that there is another cause, just what it is we can only make guesses at. The excessive amount of moisture doubtless had considerable to do with it as the soil was completely saturated from early in the spring until after the crop was harvested, preventing the needed air from penetrating to the roots. Variety seemed to have but little to do with it, as all were affected more or less. Warfield being affected the worst of any on our grounds and Dunlap the least, Dunlap giving us the only berries of really good quality that we had this season.

We do not have a very extended list on our Badger State Farm but rather confine ourselves to a few varieties that we find reliable croppers. Warfield, Dunlap and Enhance are our lead-

ers. August Luther has been our best extra early berry and Grandy our best late berry. We are testing Aroma and Sample for late and believe they will prove valuable.

We planted as an experiment last spring one-half acre to Dunlap which we gave the hedge row culture charging up the plants at \$2.50 per M. and all labor at 15 cents an hour and it may be of interest to members to know that this plot of one-half acre has cost us \$50.00 to date against \$35.00 per acre that a ten acre field, also planted last spring is owing us to date, that was given matted row culture. The cost of the hedge row culture could have been reduced materially had we been able to get boys to do the runner cutting.

We shall keep a careful record of the yield of this plot next season to determine whether or not the hedge row culture is profitable in a commercial way. The one-half acre plot was certainly an attractive looking strawberry field this fall before it received its winter covering, and we expect to get some fancy fruit from it next season.

C. L. RICHARDSON.

The strawberry crop in Chippewa county was below the average both in amount and quality. Individual patches did well but many fields produced only a half or a quarter crop. The first picking was June 15th or 16th rather later than usual, and the season cloud a week earlier than usual. Our crop was the lightest in several years.

Of the 65 varieties I reported last year, we have dropped about 40. Many of the discarded varieties are valuable but it is extremely difficult to keep so many varieties.

There is little value in reporting upon old and well established varieties, and yet when they show new tendencies, these deviations become interesting. Cameron's Early was perhaps the earliest variety to fruit and proved fairly productive as heretofore, but still it is not satisfactory. Michels' is no better. We have about settled down to the Excelsior and Johnson's Early as the two best early varieties for loam and clay respectively.

Again the Haverland maintained its reputation as the best cropper on our grounds. It produces more quarts of medium to

large berries than any other variety we have ever had. The Dunlap, Bederwood, Warfield and a seedling of our own did about equally well for second plan.

The Warfield is unquestionably deteriorating, so is the Excelsior, and it is probably only a question of a few years until the Senator Dunlap begins to loose its vigor-productiveness. Up in our country a few of us think we see signs of deterioration in the Haverland.

Among the moderately late varieties we think the Marshall, Glen Mary, Aroma, Sample and Marie are the safest to tie to. Among the new comers we were the most favorably impressed by the Challenge. The plant is big and stocky. It looks so much like the Glen Mary the plants are hard to tell apart except at a distance.

The plants do not overcrowd but make a big enough row. The berry is blunt, rather rigid, large and extraordinarily firm, and of quality above the average. The Miller did not make a good showing. Lady Garrison looks promising but needs further trial. We keep a few of the Jerry Rusk for its large size, good shape and fancy quality.

We are sorry to report that the Splendid did not make a good showing. The plant never made a good row. There was nothing especially the matter but just a general failure to do well.

The two latest berries last year were the Midnight and Nettie. The Midnight was very late—later than the Rough Rider or Hunn. A few of its berries remained until about July 25th, but it was a dismal failure. We had a fine row of plants, but when the time came for berries the plants turned yellow or rusted. Many of them died outright. Many of the blossoms failed to set any fruit, and that which remained was hard and seedy. We shall give the midnight another trial on heavier, richer soil. The season was evidently unfavorable, and we think the plant would do better on a clay soil.

The Nettie is much more satisfactory. It produces scarcely enough plants but is very late and produces a fairly heavy crop of large shapely berries. The berries are rather soft, the flavor is insipid, and the color is a peculiar yellowish tinge which is not pleasing, resembling its parent the Hunn.

There were few complaints of pests this year. The leaf roller prevailed throughout our section to some extent, but did no serious damage.

Mr. Richardson: Right here I would like to say that we are

having the same difficulty with the rotting of the roots that Mr. Hanchett spoke of as characteristic of the fields of Sparta. We have not been able as yet to find out whether it is general weakness of the plant or whether it is some species of pest that is attacking it. I am almost inclined to think at present that it is some form of disease and not merely winter killing. It acts in such a peculiar manner, but whether it is, it is a pretty serious problem up in our country and it is getting more serious every year. We have acres and acres throughout our section where the plants came out from winter quarters apparently looking well, and then when the blooming season came on they began to go down and they were dead before it was time for the first picking to take place.

DR. T. E. LOOPE.

I have not any paper prepared upon the strawberry, and I do not know very much about it anyway, although on that account I ought to be able to write a very good paper. I had only a medium crop of strawberries, but I probably had just as much as I deserved. We had serious pests, and in regard to the root killing, that trouble that has been spoken of here, I have my opinion about that. I have had that on my farm and I have always attributed that at my place to the winter and nothing else. I believe that with me, I am not talking about anybody else, but with me, I occasionally get a hard winter that is peculiarly hard on the strawberry and for that reason I get occasionally that same condition where the roots are diseased and where the plants do not do much, and any man who is foolish enough to grow strawberries as far north as Chippewa Falls would be liable to find that same trouble, and our friend Richardson comes from that region. I do not know but what it may be just as prevalent in the southern part of Wisconsin, I do not know anything about that.

As to varieties, I have not got any. There are only two that I have anything to do with and our friend Crawford is responsible for one of them, and that is the Dunlap; the other is the Warfield. I have had a dozen other varieties that I never could get many berries from. Understand that I do not say there are not other good berries in other localities, but with me the

Warfield and the Dunlap are the only ones that I will consider, I would not plant another one if you furnished it me that I know of.

We have occasional pests. I am not troubled with the leaf roller as a rule. Years ago I had some of the leaf roller work that made serious havoc with the berries, but of late years I have not had that. The greatest pest that I have to contend with is June grass, and there is good reason for that. The soil that I have seems to be peculiarly adapted to the growth of June grass and I seem to have plenty of seed in the ground and I can take care of my strawberry patch in first class condition up to the first of August, and in the spring my ground is covered with June grass and it grows and flourishes until the berries are picked and sometimes way above the vines in spite of all I can do, there is no use talking. I see most of you take care of your patches until the first of August and keep them well cleaned and well cultivated until you get through picking, it is not so with me, I grow berries in the grass and if my friend George J. were here, he would remind you of that any way, because he always talks of my growing berries in the grass, he has seen it himself, so that while I am not a strawberry grower, I still grow some strawberries every year, a few of them, but I will not take up your time, because there are many others here that are capable of giving you more information than I can.

M. S. KELLOGG, Janesville.

I am somewhat like our President, I have no prepared notes, and will simply give my review of the season as it has been impressed upon me by last year's work.

At Janesville the strawberry season opened on June 5th, and reached its height June 17th, being rather shorter in the first crop than as a rule with us in the southern portion of the state. The last picking of any quantity that was disposed of on the market was July 8th, so that the latter portion of the season really made up in length for the shortness of the forepart. With us, as has been stated by the other speakers, the quality of the berries this year, as far as flavor is concerned, was decidedly under the average. As regards size, our berries ran from me-

dium to good size, but in firmness were very much under the usual condition on account of the very wet season, in all, perhaps we had two-thirds of a crop.

Of the varieties that we grow, nearly all of them are what would be classed with the standard market sorts. We have found by costly and many tried experiments that the testing of new varieties is a business in itself, and have discontinued the planting in a large measure of many of the newer sorts, although we are testing many new varieties at the present time, besides those that we care for. I have in mind that there are 24, I believe that is the number, of sorts that we regard with any degree of making them a part of our strawberry department. In these the best early varieties with us have proven to be the Warfield and Bederwood; for mid-season, Clyde, Dunlap and Parson's Beauty, and in regard to the Parson's Beauty, there is the nearest approach to the Old Wilson that we have been able to find in all the varieties that we have ever tested. It gives us some of the very finest berries, and berries that will bring the very best price upon any market, it is firm, has good color, good size and ripens evenly. Our best late varieties are Sample and Klondike. Klondike will not do as a shipping sort, but for a local market or home consumption there is nothing that is better as far as quality is concerned.

I do not feel like taking up any more time, because I believe we will all gain more from the discussion that will follow these talks than we will from the talks themselves, and I will give way to the next speaker.

L. A. CARPENTER.

The strawberry question is pretty late to be before the people today, I think, and the subject of the season I think is about the same in all sections. We had a very wet season to begin with, and up to the middle of June we had so much water that it was almost impossible to do anything in the strawberry field. We left our strawberries covered until they began to start considerably in the spring, which held them back nearly a week. A great many of the growers in our section were picking berries in considerable quantities a week before we commenced, this last season, and those who had their berries ripen very early had a

great many soft berries. I do not think we have had in a great many years a better crop as to quality, and our yield was fully up to the average the past season. The Senator Dunlap and Warfield are our main varieties for market; they come in about mid-season. The Staple is our best variety that we have ever tested and we have planted considerable of that variety. They ripen their main crop a week ahead of the Warfield. The Arrow is the best late variety we have ever tried; it is similar to the Haviland, but with us it makes a better growth and yields more berries. They have a peculiar glossy appearance which makes them look very attractive in the box. The Michigan we have tried for several years, but have not found it a success in either plant or berry.

There has been a great deal of discussion about the merits of the hedge row and the old matted row system. We have always propagated our berries by the matted row system, but we are thinning them down so as to get them as near the hedge row system as possible. We find it takes a great deal of work to keep the runners in. For our four best varieties for market I would name the Warfield, Dunlap and Arrow for late, and the Staple for early.

STRAWBERRIES.

CHAS. L. PEARSON, Baraboo.

Up in the Devils Lake region we had a heavenly lot of strawberries last season notwithstanding our near proximity to the resort of his satanic majesty. Nearly all varieties were good. Everybody said "My berries are fine," and every farmer's garden "butted in" on the market and bought groceries for the family.

Irrigating plants were more ornamental than useful as heavy dews were of semi-annual occurrence.

Senator Dunlap who has for several years been a rival of Mr. Bederwood finally succeeded in winning Miss Warfield and now the happy pair are always seen together. When asked why she preferred the Senator, Miss Warfield replied that he was handsomer and stronger, had a healthier color and could earn more

money than Mr. Wood. Mr. Wood looks pale but says he does not want any partner and can earn a lot of money all by himself.

Aroma and Sample are a pair of heavy weights. They are a little slow but when pay day comes around they are the envy of their neighbors.

Clyde is pale and easily mashed, but earns good money in some positions. Bisel doesn't make much noise in the world but gets the dollars just the same. Splendid, Bubach and Haverland are a trio of good workers but they can't stand travel.

The past strawberry season was not as profitable financially as we hope next year will be, but it helped clinch some useful lessons, here are a few of them.

Buy good plants but don't pay an extra price for balloon juice, otherwise called pedigree. Half a dozen varieties are enough for main crop. Too many kinds will multiply your trouble. Don't let your plants mat thickly. You wouldn't expect much corn if the stalks were an inch apart. Don't wait for your berries to dry off before picking in a rainy time. Some years are materially wet most of the time. Don't depend on the mail in strawberry time. Put a telephone in your berry shed connected with the city central and the telegraph office,—use them. Make the distance between the berry field and the consumer as short as possible. When you get a load of berries send them to the station at a three minute clip. There'll be horses when berries are gone. Don't sell all of your berries yourself. The commission man wants to live. Don't hope to get fat in strawberry time. You'll lose about fifteen pounds for every thousand cases marketed. Don't go back on the cows, the pigs and the chickens. They'll help pay bills while strawberries rest. Don't smoke ten cent cigars in berry time. The man with the white blanket will be around in the fall asking what has become of your winter's wages. Don't get saucy to your pickers. They might reprimand, suspend or discharge you. Don't expect to get rich on strawberries in one year—it might take two.

DISCUSSION.

Prof. Whetzel: Speaking about the root diseases in strawberries, I should judge, from the descriptions that the different growers have given, which were all practically the same, that

the trouble you have is exactly the same as we have in the state of New York. Now, I have never grown any strawberries myself, I have never had many berries from my strawberry beds, because I just set them out last spring in my own garden, I had a few, but I had this trouble in my strawberries this summer, and while a number of people are inclined to think it is due to winter killing, I am inclined to agree with the gentleman who said it was due to some special disease. I will tell you why. If it were winter killing, I could not have the same disease in my garden, because the trouble came after my plants had been set out in the spring. I set my plants in the spring and along in the latter part of July and August the roots began to die, the leaves would curl up and turn brown and there would be only one or two roots holding the plant to the soil. These plants I set out made runners, and oftentimes you cannot tell the row where I had taken out the diseased plants, there were runners set and I have plants filling up those places, but that was even before the runners had established themselves, the whole plants had died. I have had lots of specimens of this trouble sent in and I have examined the roots very carefully, but I never succeeded in finding any fungus or bacteria that causes the trouble, but that does not signify that it is not there. Any plant botanist will tell you, I think, that it is very difficult to locate trouble in the roots of plants, because there are so many soil and fungous bacteria that you will get in the examination that you cannot tell from the microscope that any one causes the disease. So I spent a great deal of time last summer getting cultures, I never succeeded, although I did succeed getting bacteria, which when introduced into the stems of the leaves in plants that were kept in quite a moist condition, I got the blackening of the stems, and the dying of the leaves and even the killing of the crown and some of the roots, but that was in only one or two cases, and I could not really base an opinion upon it, but I believe it is due to a bacterial disease of the roots and the very fact that it comes so long after winter time inclines me to that opinion, at least the trouble we have I hardly think it is due to winter killing, because it frequently attacks plants that are set out in the spring which were strong and healthy. I hope we may be able to give you some light on the subject, because it is something we are going to work

on at the station during the next year. It is of considerable importance to the growers in the state of New York, and I judge from what you said that it was of very much importance to you.

Mr. Goodman: We have the same trouble down in Missouri and we have attributed it all to summer killing, especially during this last summer which was extremely hot and wet. I will ask you if such cause could not cause root killing as you have mentioned, having so much rain and extreme hot weather which would sunscald the roots?

Prof. Whetzel: Of course if the season is very wet, that lays the foundation for trouble in the soil, but the roots that I examined began dying mostly at the ends and worked mostly toward the top. Frequently you will find trouble; next to the crown you will notice that it is healthy, but below that it is dead. Of course it is possible that some weather condition might cause it, but it does not look that way at the present time, this problem we have to investigate.

Mr. Kellogg: Another question—would it not be a matter of fact that in this summer killing the tips of the roots would be the first destroyed, in place of those nearest to the crown?

Prof. Whetzel: If the water which was around the roots were excessively heated after a rain, it might be that the injury was done there. You must remember that the deeper portions of the roots would be the last to be heated, the heat would affect the upper surface of the soil first. The water does not heat so very rapidly as to heat the soil. If you have a notion that that causes the trouble, a good thing would be to test the temperature at different depths on a day that you think would cause the trouble.

Mr. Rowe: I would like to ask a question, whether or not this is found where there has been no freezing and thawing of the ground during the winter; in other words, has this trouble been found where the ground has been protected, so that there has been no freezing or thawing of the ground during the winter?

Prof. Whetzel: As I say, my plants had not been in the ground in the winter at all, but the disease appeared after I set them in the spring.

Mr. Rowe: Might not that have occurred during the freezing and thawing in the winter and you have not found the result until after you set them out?

Prof. Whetzel: In the ground where they had been growing?

Mr. Rowe: Yes; that was true with us over in the Grand Rapids fields, acres and acres of strawberries set out two years ago, the plants looked as fine as anything you ever saw when they were set out; those plants went before the middle of August right straight along where they were taken from beds that had not been heavily mulched so as to keep them from freezing and thawing during the winter. I myself had that season a special lot of Aromas and because they were so fine in the market I sold a lot of plants, something over forty thousand plants, just to neighbors. Now, every plant that came from the field that was not mulched before the middle of August was gone, that is, two thirds of them were gone, but from another patch of the same variety, on the same kind of ground that was heavily mulched, we did not lose any, not any of them were lost, they were a perfect success, and so I laid it to the fact that in that bed that was not mulched, that the ground would thaw about an inch or an inch and a half, then it would turn cold and freeze up and while it would not break the roots square off, it would bruise the sides of the roots and while digging them in the spring they looked fresh and nice as any roots could look, by the middle of August they were dead.

Prof. Whetzel: The plants that I grew came from our Experiment Station; they were very well mulched during the winter time. More than that, if you attribute it to the freezing and thawing of the upper inch of the soil, you would necessarily expect the upper inch of the root would be the one that would die, but that was not the case. The tips under that condition would have been frozen all winter.

Mr. Hanchett: I am decidedly satisfied that the injury to our strawberry crop was due to some other cause besides winter killing. I have made it a practice for years, the first thing in the spring after the frost is out of the ground, to go over our strawberry field, dig up a plant here and there, take it to the house and wash the roots out carefully and see what the color is, then take my knife, slice them up a little at a time to see how they look clear through. Last spring, after I had done this, I decided we were going to have a great strawberry crop. The roots looked actually as bright as though

they had been growing in snow all winter, and as far as the freezing was concerned, there was but very little frost in the ground anywhere. When the snow melted, it all soaked into the ground and I feel positively certain that it could not be due to winter killing last year, but it must be due to fungous disease or blight.

Mr. Smith: Well, we got the worst effect from it last season on a little rise of ground just up in a little hollow a couple of feet deep where the ground was dry, that is, as dry as any ground can be where it rains every day, and the plants had been mulched during the winter. We always mulch our strawberries in the winter,—but it started in a certain spot there and spread almost as round as a wheel, kept growing larger and larger as the season advanced, until the fruiting season was over, about I should think the middle of July perhaps it seemed to stop working. It always widened out that circle right on the edge, like setting a little fire in a bunch of dry grass and working out on the side. I made up my mind that it was some sort of contagious root disease.

Mr. Crawford: I am a little in doubt about is being winter killing, however, I will tell you a little experiment that I carried on in the field. That year I took up a lot of plants and packed them just exactly as if I were going to mail them, put parafine paper around them and then the heavier paper and took them out and laid them in an open frame out of doors where they froze and thawed all winter long, sometimes they would be thawed, sometimes they would be frozen. When the spring came I planted those strawberries out and they all grew and did well and had ripe berries in June. Now, it has been my practice very often, knowing that we are going to be short of time and short of help in the spring, to dig up the plants and root prune them and heel them in so that we can transplant them later in the season. We are troubled with lack of help in our neighborhood, because every man and boy that can work is taken into Akron or goes into some shop, so we cannot get help. So I take these plants when I have time and they are cut back to about an inch. Now, you would think that cutting the roots all off within an inch would be equivalent to winter killing but instead of that they send out a lot of nice white roots and then when I am ready to plant them out, in June, about the time berries

begin to ripen, they are well supplied with white feeding roots. I am so well pleased with that method that I have thought sometimes of doing that with all our plants. Naturally, to set the plants out and cut the roots off, that will make them send out new roots from the crown and from the short ends and make feeding roots and establish the plants.

Mr. Rowe: There is another question I would like to ask in connection with strawberry culture of these gentlemen presenting papers, and that is, approximately how much do they expect to spend on one acre, what does it cost you to grow an acre of berries ready to pick?

Mr. Hanchett: I have stated in my paper, about fifty dollars.

Mr. Utter: Let me ask if that includes the cost of fertilization?

Mr. Hanchett: No, it does not. All the fertilization we do is with stable manure that is brought from the stable and spread upon the field; the cost as given in my paper did not include that. We put on probably about ten loads of manure to the acre. The cost as stated in my paper was \$350 for ten acres, kept in matted row culture from last spring until they were ready for winter, that included the raising of the plants, that was matted row culture. A half acre of hedge row culture had cost us \$50. That includes the winter covering. They will cost us probably \$5.00 an acre more before they are ready to pick. I think that the cost of \$35 an acre is rather less than the average cost. I know we considered this field had been one of the least costly fields that we had ever planted and cared for the first year. I think that we might safely add from five to ten dollars per acre more to that for average conditions.

Mr. Smith: I never kept any tab directly on an acre of strawberries, but I think Mr. Hanchett's estimate is quite conservative, I am sure that it is if you take care of them later than the first of August. We do not put our cover crop in as the doctor does.

Mr. Kellogg: My estimate would be from \$45 to \$60 per acre, depending on the local condition and season.

Mr. Bingham: I never kept account of the expenses on an acre. I should judge from \$45 to \$50 would be a fair price.

The President: What does it cost in Minnesota?

Mr. Brackett: In answering a question of that kind, a man would have to know something about what kind of soil he had,

whether it was weedy or not, whether it had been neglected for a number of years and grown full of weeds. If you can do most of your cultivating, keep the weeds out with a cultivator, you can do it comparatively cheap, but if you have to depend on people to take the weeds out by hand, which you would have to do if the ground were filled with weeds, you could not do it for \$50 an acre, including price of plants. I should say on an average the cost through this country would be between fifty and sixty dollars.

Mr. Utter: I never kept account of the real cost, but I think it costs me at least \$20 an acre for fertilizers, fertilizing with manure, and the covering costs \$10 at least, and I think \$75 with my methods of cultivation would be a conservative estimate. Right along this line, let me ask if it is the practice to discontinue cultivation as early as possible, or how late in the season is it profitable to cultivate?

The President: I would like to hear from Mr. Crawford on cost.

Mr. Crawford: At Jolinsville, (?) Ohio, where they raise a great many strawberries, and they are nearly all grown in the hill, it costs \$100 an acre on an average.

Mr. Pearson: I have never kept accurate account; I should think probably about \$50 or \$60 an acre would cover the cost, the way I cultivate, for of course it depends, as the gentleman said, on how weedy the ground is, but sometimes our neighbors, in judging by their grounds, think it is not very weedy when it is. In one case one of my neighbors crossed my field and he said I was lucky to get my strawberries on ground that was not weedy. Well, that was the hardest piece I ever had to keep free from weeds; I did not attribute it so much to luck, either, that it was free from weeds, as to good hard work.

Mr. Richardson: I kept track, as near as I could, on three acres several years ago, estimating our rent at \$4 an acre and counting our help at \$1.50 a day, hoeing our field seven times and cultivating seventeen times during the season, estimating our expenses as near as we could of marketing them at our town five miles away, it cost us between \$96 and \$97 an acre.

Mr. Rowe: I want to follow that up with another question as to the gross returns per acre at these prices for cultivation. It now costs me \$135 to \$140 an acre; it used to cost me \$30.

Mr. Post: The thought came to me, it would be well to ask how long it has to run, and what the quality of strawberries is

that are raised; it makes a great deal of difference. The quality of strawberries depends on the cultivation to a great extent; that has a great deal to do with the question of what it costs to raise strawberries. I have a neighbor who runs a bed two years, and of course he can raise a lot of grass and a lot of strawberries, but if you want to get strawberries to supply a good market, you will have some expense. That is true in everything, and it costs me at least \$50 an acre, just mulching alone, to protect those strawberries as they should be, and get a first class crop, and when you say you cultivate seventeen times, and that is necessary, it costs you over \$100 to run a strawberry bed as it should be run.

The President: Now, let us take up Mr. Utter's question. How long do you cultivate?

Mr. Smith: Cultivate until the ground freezes in the fall.

Mr. Kellogg: Same here.

Mr. Hanchett: We cultivate until the latter part of September.

Mr. Utter: How deep should we cultivate, those last cultivations?

Mr. Smith: Shallow.

Mr. Kellogg: Shallow.

Mr. Utter: What do you call shallow?

Mr. Rowe: An inch and a half. Late cultivation is to cultivate between the rows, to keep them from taking root between the rows, because if they do they will come up through the mulch in the spring and they will be in your path and bother you.

The President: Now your question, Mr. Rowe, was what?

Mr. Rowe: What do you expect from the acre for the amount that you invested?

Mr. Utter: The results this last year of two and one-half acres was 1216 quarts, gross receipts about \$1,050. I would say one acre of this was carried over the third year, and that was cultivated and well kept, as well as my first year's bed, and was nearer a hedge row system in one of the years, and I had my largest berries on the third year. I would not advise as a rule a third year crop; I succeeded this one year.

The President: Mr. Crawford, how much do you get?

Mr. Crawford: I am unable to tell, Mr. President.

Mr. Rowe: The point I wanted to get at was simply this,

that in my own experience I have found that by increasing the amount that I put into an acre from \$40 or \$50 to \$130, that I have increased my returns from that acre more than six times. In other words, in putting in \$40 to \$50, the returns from an acre, taking an average in a period of five years, would be about \$90 to the acre in which I invested \$40 to \$50. Of course that was in a strawberry market where berries ran from 6 to 8 cents a quart, not having the prices that you have further north. But when I increased my amount of labor and amount of attention, to the bed, put in \$130 per acre, then I found I was getting a gross value of \$500 an acre off from the same amount of soil, but simply by the increase of labor, not the increase of fertilizer, but the increase of actual labor on that ground, and I account for it simply by this, that the water that goes up by capillary system to feed the roots of the plant, brings up at the same time plant food, brings up the mineral matter from below, and it naturally, consequently, deposits itself on the surface of the earth. I have got beyond the point of cultivating for the purpose of conserving moisture, I cultivate constantly for the purpose of keeping the food down where the plants can get it, and when you do that your moisture is conserved also, but it is not a question of conservation of moisture, it is a question of keeping the plant food down where the plants can get it.

The President: Mr. Rowe has the solution of the thing down pat. Now, are there opposing opinions. Mr. Kellogg; how much do you get?

Mr. Kellogg: That is a hard question to answer. We have never kept accurate record of our returns for our strawberry fields with regard to area, and I would say that our experience has been along the same line spoken of by Mr. Rowe, that the more you put in, the more you get out, aside from the fact of increasing the fertilizer; the more work you put on an acre, the more you will get, and the better crop you will get.

Mr. Hanchett: I have had a great deal, of contradictory experience in the matter. The largest crop of strawberries I ever harvested was on a piece of land that we bought from a neighbor and it was given the most slipshod cultivation that I ever saw, and yet we got the best strawberry crop out of that one acre that we ever harvested. I do not think it was a good plan at all, I tried the same method the next year to see if I could continue that method and did not get good results.

Mr. Richardson: The returns on this field of something less

than three acres which I spoke of, which cost us about \$97 an acre, were \$502.80 in returns from that field.

Mr. Smith: The price has so much to do with it that I hardly can say what can be gotten off an acre. Sometimes strawberries sell at forty cents a case and it is hard to find a buyer; that does not compare very favorably with the result when you can get \$1.25 to \$1.50 a case, so that it is a pretty difficult point to say anything upon. We do not consider that we get a good crop unless we get at least 100 or 200 cases to the acre and I want 500 or 550.

Mr. Brackett: It is pretty hard to decide what a man will get off an acre of strawberries unless he takes a number of years to base that theory on. Strawberries are rather an uncertain crop. You may have one year that you will have an immense crop, then you may skip two or three years with half a crop, and the only fair way to get at that would be to make some kind of attempt at an average of the different years. I remember two years ago I had an acre, almost all of them Dunlap, I took off that one acre 11,000 quarts of berries; I turned them over to our fruit growers' association, and they brought me that year \$600, and the price was rather low that year. You may think it is an old saying, that the man that tells the last story always has the best chance.

Mr. Webb: This being true, I want to tell Brother Brackett that he is not in it. I know of a man that netted \$700 on one-half acre last year, and he has netted not less than \$500 on half acres for the last five years.

The President: Where is that man?

Mr. Webb: That man is in Douglas county, Wisconsin, his name is D. W. Terry and he is a darkey.

Mr. Goodman: It seems to me we lose sight of the fact of how much these berries cost us and that depends on the ground in which you put your berries. We never think of planting berries down in southern Missouri unless we put them on new ground, and it never costs us more than \$25 to \$30 an acre to take care of them. We do not get from \$500 to \$600 an acre as returns from that, but we are perfectly satisfied if we get \$200 or \$250, sometimes it runs as high as \$400 or \$500, but with \$250 we are perfectly satisfied. But if you take new ground and put out your plants on that, it does not take more than one-quarter the amount of cultivation and care and attention that it does

on old ground, and on old ground it would cost us \$100 an acre. We can take care of that new ground for \$25 or \$30 an acre, and that is the place to plant strawberries, in my opinion. We are opening and clearing and planting new ground every year, and that is the only crop we plant, strawberries. It saves us a great deal of cultivation, not only that, but it is the proper place to grow them. We are clearing new ground every year.

Mr. Street: I would like to ask Mr. Rowe how far apart he puts his rows how wide he lets the runners widen out, and how he keeps the plants thinned on varieties such as Warfield and Dunlap?

Mr. Rowe: I set out a double row of plants four feet apart, the centers of the rows four feet apart, and I set out a double row of plants; the two rows, if they were close together would be about six inches apart. I use that system, because it is easy to show the men how to do it. I cut off all the first runners, and I allow the row to widen to just about 16 inches, and I keep the plants out just as near as possible so that the plants are not closer than three inches.

Mr. Street: What do you do to nip the stems.

Mr. Rowe: Hand work. It is all hand work, the "Man with the Hoe." I have tried the wheel hoe and I have tried all sorts of systems, but I find a man with the thumb nail, using it as he goes along, is the cheapest and most satisfactory.

Mr. Street: We had a little experience last year, and I am indebted to Mr. Coe for that, he put us on to that at our northern meeting. I put my strawberries in two feet-nine, and I put the plants two feet apart in the row, and I use the runner cutter, a kind of light cutter that Mr. Coe told us about; take a handle and a file, have the blacksmith turn it over and sharpen on the inside, and you can go along and use that and when you think the plants are getting too thick put it in criss cross, that will take out the weaker plants and leave the more solid plants. Do that along toward September, and that is the nicest way I have ever seen.

Mr. Rowe: That is the same proposition as when you let the plants grow and pull them out, then you lose the strength that goes toward making the crown. We want to build up the crown, so we do not allow the plants to make any more plants than we want. We never pull plants out with the roots, we cut off the runners. Let them make plants, but not more plants than you

want, as quick as you do that, you are exhausting the strength of the plant, wasting the strength, if you want to have a crown made there is where the extra expense comes in.

Mr. Pearson: I was a little surprised at the meeting I attended in Iowa where they recommended crossing the rows late in the fall with a smoothing harrow, with a team, and pulling out the weak plants. I would like to ask if there is any one here that has ever tried that.

The President: They must be pretty weak if you can pull them out and select as you are going.

Mr. Kellogg: Right along that line, would it not be a fact that if these same parties having this same soil, but putting in a little more work and thinning these plants out by hand, would not have returns that would be fourfold or sixfold, as has been proven on Michigan soil? I believe they would.

The President: Here was a question from the question box: "Is the Corsican a good variety of strawberry?"

Mr. Kellogg: Not in southern Wisconsin.

Mr. Moyle: It does well with me.

Mr. Hanchett: We have cropped it one season and it was very satisfactory.

Mr. Crawford: We had the Corsican in matted rows, it did moderately well, we could not find fault with it, but I saw it in another place where it was grown in hills and grown with greater care and they were very nice indeed.

The President: "Where a man has only four or five acres of land, can it be made to produce good crops of strawberries for any number of years?"

Mr. Crawford: My friend, Mr. Beaver, has grown strawberries more than twenty years on the same land, and he is the most successful grower of any I have met, but he does it all by hand and does it carefully, I do not think it can be done with a horse.

Mr. Pearson: I have land enough so that I change my strawberry ground around.

Mr. Hanchett: We have found that we always get the best results by rotating.

Mr. Smith: I have seen strawberries set quite a number of times on our grounds where the bed was plowed under in July and planted the following spring, and I never saw anything but almost a total failure as the result.

Mr. Richardson: We tried resetting on our old beds three times and every time our crop has been either a failure or very poor. It is not a success.

Mr. Moyle: I do not make a specialty of growing plants for berries, I grow the plants for plants; if I try to repeat, I get them mixed up, some of the plants live through in the beds. I always change off every year to new land.

The President: "How much special fertilizer for strawberries will it require for one acre of strawberries? The land has been in black raspberries for the last ten years and have good crops."

Mr. Kellogg: Twenty loads of stable manure to the acre.

Mr. Crawford: About half a ton of phosphate would suit us.

Mr. Goodman: If you want commercial fertilizer, get this bone phosphate, dry, put up by Armour and Swift.

The President: I believe it does not mean exactly what it says; I do not think it means a special fertilizer, because I think barnyard manure would do as well.

Mr. Periam: If we can get enough of it.

Mr. Pearson: I do not think ashes are good on our soils. I have used ashes on my clay soil and it seems to harden the soil, the berries are smaller, it made them a brown color and I do not want any more ashes.

Mr. Utter: I think probably his soil has enough lime, sixty-five per cent of ashes is lime. I think if you use potash you had better use it in the form of sulphate of potash, or muriate.

Mr. Brackett: If you have heavy soil with plenty of humus in the ground, but if you have a light soil it is a good deal better to use either some commercial fertilizer or use thoroughly rotted manure.

Mr. Smith: I think possibly this gentleman here would be like one of my neighbors who says that ashes are of no use. He said to me, "I put ashes on my garden, I put it on four inches deep and there ain't nothing grown there since."

Mr. Pearson: I put on fifty bushels to the acre.

PEDIGREE STRAWBERRY PLANTS.

MR. M. CRAWFORD, Ohio.

The strawberry has been my specialty for nearly half a century, and on this account I have been deeply interested in the subject under consideration from the time of its first appearance before the public to the present.

Before taking up the question, I wish to state by way of preface, that I have no intention of depreciating the practice of using good, thrifty, healthy stock for propagating purposes. On the contrary I believe in it thoroughly, and make it a rule of my business.

The theory which is to be discussed on the present occasion is this: That a given variety of the strawberry can be so changed by selection and manipulation as to develop to the highest degree its desirable traits, and eliminate its faults; and that these changes can be fixed; that is, established as permanent characteristics of the variety. Furthermore, it is asserted that plants which have been thus treated have by this means acquired a pedigree, hence they are denominated pedigree plants by their growers. Still further, this method of selecting and restricting is called breeding, and the growers are designated as breeders, and their plants as thoroughbreds.

Definitions.

Before proceeding to consider the subject, it will be necessary to have an understanding of the meaning of certain terms used in elaborating and advocating the theory in question, as pedigree, thoroughbred, ancestor, generation, offspring, breeder and the like. These expressions in this connection are incorrect and misleading. The word "pedigree" is defined in the dictionary as "line of ancestors; descent; lineage; genealogy; strain;—an account or registry of a line of ancestors."

"Thoroughbred" means "bred from the best blood, as horses.

An "ancestor" is "one from whom a person descends, either by the father or mother."

A "generation" is "a single step or stage in the succession of natural descent."

"Offspring" is defined as "generation; descendants, however remote, from the stock."

The word "breed" has many definitions, but the one which harmonizes with the other terms used in the same connection is "to create; to occasion; to produce; to originate;" and a "breeder" is "one who produces."

All these words are of similar import, and all point to the relation of parent and child, and therefore they can not justly be applied to the propagation of plants in any way except by seed.

Seeds and Buds.

All fruit-bearing plants are increased either by seeds or by buds, and the great majority by both. Buds include runners, layers, offsets, grafts and cuttings, top or root. Seeds reproduce the *species* to which they belong, and when two species are crossed the result is a hybrid. Buds invariably reproduce the *variety* from which they spring. A plant grown from a seed is a new creation, and may or may not resemble its parent or parents. A plant grown from a bud is not a new creation, nor a new generation. It is simply an extension or division of the original plant, is of the same variety and possesses the same traits. Removing a bud from a plant and setting it in the ground or in another plant causes no change in the variety, and a plant grown from another plant by bud or runner is not its offspring, nor is the original plant the ancestor of the other. There is no pedigree involved by this method of growing plants, however carefully the work may be done, nor is the grower a "breeder" in the true sense of the term. He is simply a propagator. The advocates of so-called pedigree plants make the mistake of reasoning from false premises. They assume that the propagation of strawberry plants by runners is parallel to the breeding of animals, or the growing of corn or wheat from seed, whereas there is no analogy between the two. The question is asked, "If selection is good with corn, why not with strawberries?" The answer is, because the ear of corn corresponds to the berry and not to the plant. The ear of corn contains a number of seeds, and so does the berry. Each of these seeds if sown will produce a new creation, but a plant grown from another plant is, as has been previously stated, merely an extension of the plant that produced it, and is of the same variety. It can

not be changed except by environment, and such change is not permanent. The argument that plants can be permanently improved by the selection of bud variations is founded upon a fallacy; that of assuming that plants grown from other plants are new creations, like those produced from seeds, which is not the case.

Pedigree.

In order to have a pedigree, plants must be grown from seeds, and in order to have a *known* pedigree, that is, "a registry of a line of ancestors," they must be grown by intention, not by accident. The most of our popular varieties of strawberries are chance seedlings. They have no known pedigree, nor can they by any possibility acquire one, for their parentage is unknown, and must forever remain so. Thus we see that the word pedigree can not properly be applied to strawberry plants grown from other plants, and hence there are no pedigree plants in the sense in which the expression is popularly used at the present day. The word "thoroughbred" used in a similar sense is also a misnomer.

Plant Breeders.

The growers of so-called pedigree plants are propagators, not breeders. The author writes a book; the printer increases the number of copies, but this does not make him an author. A true plant breeder is a grower who takes advantage of hereditary tendencies and endeavors to perpetuate points of excellence and combine desirable characteristics by producing plants from seed. He continues this process from generation to generation, and if he keeps a record of the parentage, his productions have a known pedigree. Plants grown by this method are real pedigree plants.

Prof. Sandsten, the plant breeder of your Wisconsin Agricultural College, says that there can be no plant breeding without seed.

Bud Variation.

Next comes the question, is there then no such thing as bud variation? There is, but it is temporary. It is found in fruit-bearing plants, vegetables and flowers; but it is due to conditions, and can not be made permanent. The idea that a variety can be improved by selecting buds from the most perfect

specimens for propagation seems so plausible at first thought that almost any one might consider it a forward step in the line of progress, but further consideration reveals the fallacy upon which it is founded. The proposition is not new, but dates back nearly or quite a century.

Just here a brief digression from the text may be pardonable for the purpose of illustration. McMahan's Gardening, published in 1819, advises the selection of apple scions from horizontal branches, as "they came into bearing sooner" than others. Forty years later, the idea was advanced that vertical scions would produce upright-growing trees, and horizontal scions, spreading trees. Simultaneously with the appearance of the new idea in regard to improving strawberries by selection came the theory that scions taken from trees with certain desirable traits would perpetuate those traits in other trees into which they were grafted but there seems to be no proof whatever of its correctness. It is true that one tree in an orchard may be better than others, even one branch may be more productive or yield handsomer fruit, it is also true that a skillful horticulturist can produce great changes in the habits of trees, but these variations and changes are due to situation, soil, light, food, moisture, treatment, in short to circumstances. They are not constitutional, and can not be perpetuated in other trees with different environment. An orchardist in Massachusetts gives an incident in his own experience which illustrates this point. He had an apple tree of the King variety growing where it received the drainage from the barnyard. It produced enormous apples, but they were coarse and poor keepers. From this tree he had one hundred others grafted, and they all produced King apples of the ordinary type.

The potato has been experimented with along this line by thousands of growers and many agricultural papers have advised their readers to save the fairest tubers from the most productive plants for seed, in order to improve the variety, or at least, to keep it from deteriorating; at the same time warning them not to plant the small ones, because "like begets like," unmindful of the fact that there is no begetting in such a case. A careful potato grower in Connecticut gives an account of his efforts to improve a certain variety by marking the finest hills and selecting the most perfect tubers from these for seed. He persevered in the work for eleven years, and then gave it up as a failure.

To return to the strawberry. A few years ago a variety called the Improved Parker Earle was sent out, purporting to have been derived from the original Parker Earle by selection, but when the two were placed together and given the same treatment, they were alike.

A well known strawberry grower of Iowa wrote me last year that he had propagated the Louis Gauthier for six years with a view to increasing its inclination to bear in the fall, but had gained nothing.

The reason why all experiments of this kind fail is because the characteristics of varieties are fixed by nature beyond the possibility of permanent change. We can produce variations of many kinds by our methods of managing, but all such are temporary. For instance: Two plants of the same variety may be set at the same time, one in a good situation and the other in a poor one. The first may receive the best of care, and the other be left to itself. The next year one will probably bear well and the other poorly; but if runners taken from these two plants are set in a new place and given the same treatment, they are likely to yield about alike when the next fruiting time comes.

Try another experiment. Take a popular variety having one point in which improvement is desirable. Make an effort to increase the size of the Warfield. Select the plants which bear the largest berries, and give them the best possible cultivation and management. From these select again and continue this process until satisfied that the fruit has reached the maximum size of which the variety is capable. This will probably come to pass the first year, but further trials may be made if desired. At the end of the time fixed upon for the test take plants from this bed and set them in a new place. In the same bed set an equal number of plants of the same variety taken from a plantation which has received ordinary or scant care, or perhaps has been neglected for the same length of time. Give them the same treatment in every particular, and when they come into bearing there will be no perceptible difference in the size of the fruit.

When I began the investigation of this pedigree question about two years ago, I advertised for plants which had been growing under neglect for a long time. I received many varieties from many different localities. Some came from an old orchard where they had roughed it for thirty years, some from abandoned beds, and many from out-of-the-way places where

they had received no attention. A few were regular nursery-grown stock from reliable growers. I gave them good care, and last year they all blossomed and bore fruit, "each after its kind." Nearly all of those waifs of the wilderness yielded crops that would have been a credit to plants that had been petted as long as they had been neglected.

Suppose for a moment that the bud variations found in plants could be made permanent, how long would varieties retain their identity? One grower would find one valuable variation, and another, another. Each by judicious management would raise his selection to the highest point of excellence where it would become fixed. On the other hand, plants of the same variety poorly cared for or left to themselves would deteriorate, and why should not this condition also become fixed? The original variety would be lost between these two extremes.

In spite of all our efforts, varieties retain their individuality. The law that no fixed or permanent change in their characteristics can be produced by any amount of manipulation is as inflexible as the multiplication table. It may seem that sports are an exception to this rule, but they are not the result of effort. They simply come. Among flowers they are not infrequent, but in fruit-bearing plants they occur very rarely, if at all. Even if they were common they would afford no argument in favor of the theory of the permanent improvement of varieties by selection, for a lifetime of the most painstaking effort could not produce a sport.

One More Question.

In the foregoing pages I have endeavored to show that bud variation in plants cannot be made permanent; that the theory of permanent improvement in varieties by selecting plants as by selecting seeds is a fallacy; that propagating plants by runners is not breeding, nor are those who do the work breeders; and that plants thus propagated, by any system whatever, can not acquire a pedigree in the process, and hence they are not pedigree nor thoroughbred plants. After all these points have been considered and disposed of, one question still remains to be answered, and it is an important one. Are so-called pedigree plants superior to other well grown and healthy ones for producing fruit? The strawberry industry in this country has assumed immense proportions within the last few years and many

growers now devote themselves to it exclusively. To them and to others in varying degrees, the matter of a larger or smaller crop is of great moment. The plants depended upon to yield the crop have much to do with the results, and planters naturally desire to obtain the best. Many have made tests to assist them in determining the question of merit, and many others have tests now in progress for the same purpose. Since commencing the investigation before alluded to, I have received about a hundred letters from growers who had tried so-called pedigree plants side by side with others to see how they would compare. The writer of one of these letters considered the so-called pedigree plants decidedly superior, and gave an account of tests which had resulted in their favor. Three or four expressed belief in the theory, but had made no tests. Among all the others not one had had found the so-called pedigree plants any better than common ones, and many pronounced them inferior, the plants being smaller, their growth less vigorous, and their yield disappointing. What berry growers want is first class stock, good strong plants, whatever the method by which they are grown, or the name by which they are called. They must stand on their own merits, and be they designated pedigree or common, good plants are satisfactory, and poor ones are exactly the opposite. It is customary for those who grow plants for sale to use good thrifty stock for propagating purposes as a foundation for the same kind to sell. If the advocates of the pedigree idea choose to select their stock plants one by one, it is a harmless pastime. The resulting stock is none the worse for the selection, and many tests and observations have shown that it is no better.

Prof. Troop, of the Indiana Experiment Station, wrote last month in reply to an inquiry, "The Pedigreed plants were away the poorest in point of yield this last season. I am going to give them another trial."

The Ohio Experiment Station in its strawberry bulletin for 1905 gives an article on "Pedigree Strawberry plants," also an account of tests carried on at the Station, from both of which I will quote in closing:

"The word 'pedigree' as it is used with reference to strawberry plants is a misnomer. It tends to confusion in the minds of many, and leads to deception. The word is used out of its true sense to convey the belief that a condition exists

which does not and can not exist, or if it could exist would have no value.

"One may find what appears to be an improved strain of some variety of strawberry. He may accidentally stumble upon it, or he may systematically search for it. He may resort to whatever means or methods may theoretically seem most likely to yield the best results, but in all cases the supposed improvement must be put to the test. No pseudo-scientific nor semi-scientific explanation of how it was done will prove that such plants are in any way superior to other plants of the same variety. The proof must come through trial alone. In all cases the final test is in the trial pot. In no other way can we estimate the effects of environment.

"The Experiment Station has put some of these so-called pedigree plants to the test, and they have been found wanting. In 1903 seven varieties were on trial. An equal number of so-called pedigree plants and of plants of the same variety from a reliable grower were planted side by side and given the same care. Five of the seven varieties gave better yields from the common than from the so-called pedigree plants. In 1905 eight varieties from the two sources were on trial. There was a uniform and comparable stand, except in the case of the Bubach, the common plants making a poor stand. Not rejecting the Bubach, four varieties of the so-called pedigree stock took the lead against four of the common stock. The positions of the Warfield and Sample were reversed in the two seasons. The results of these two trials were about the same as might have been expected had all the plants come from one grower. The results are inconclusive, which negatives the claims made for so-called pedigree plants."

DISCUSSION.

Prof. Hedrick: I do not want to get into a discussion as to the philosophy of this matter of plant selection and pedigree plants, but I do want to cite a few instances that have come under my own observation and a few experiments, for that matter.

I suppose the notion of pedigree plants, at least the term,

which is a very unfortunate term, originated with Mr. R. M. Kellogg in Michigan. I was in Michigan and connected with the Michigan Experiment Station when Mr. Kellogg began his so-called pedigree plant system of breeding strawberries. At the Michigan Horticultural College we were asked to test these plants, and we began using Mr. Kellogg's plants and we began selecting plants on our own responsibility, leaving out of consideration Mr. Kellogg's plants, and, by the way, many of the tests with pedigree plants have been carried on with plants brought from Mr. Kellogg's place, and I think that unfortunate, but, taking our own experiments, we found, carrying on experiments in the greenhouse so that we could control conditions absolutely, that the Bederwood selected for three or four years and compared with the Bederwood grown out of doors, several hundred plants in pots in the same kind of soil, in the same temperature, all conditions the same, we found a most striking difference. Mr. Rowe, who has just gone out, frequently saw the experiment in the greenhouse and knows very well the outcome of the experiment. I am not sure but Mr. Moore, who sits here and who is connected with your Experiment Station, also saw the experiment, which was a decided success in all respects.

That is one experiment with strawberries. The same thing, Mr. President, was carried on a much greater length of time with the violet, and Mr. Gunderson, the florist at the Michigan Horticultural College at the present time, has a strain of violets bred up for the past ten years that is superior to any violet that I know in the whole country, and I go about a great deal, and see violets in different establishments throughout the violet-growing season. I want to cite some other facts, I do not want to become tiresome, but I believe in this matter of plant selection—I do not want to say “pedigree,” but in the matter of breeding, of plant selection. Last fall I visited the fruit farm of Mr. George Powell on the Hudson. Mr. Powell had found in his orchard a tree of the Duchess that differed from others, the fruit was superior and bearing qualities were superior. He found this tree a number of years ago and immediately began grafting other trees in this orchard and propagating the other stock from this good tree. Those trees that were so propagated are superior in every re-

spect, any one only needs to see the fruit of these trees to be convinced of the superiority of these grafts.

A few weeks ago I was in New Orleans and visited a sugar plantation. As you may know, sugarcane is never grown from seed, it does not produce seed, it is propagated vegetatively. I was told there that they were getting new varieties continually and in fact all their varieties must come from variations which come from the sugar cane propagated in this way without seeds, they have no other means of getting new generations, but simply by selecting these variations which we know occur in all plants.

It must be recognized as a fact that there are other plants which never have seed, yet vary and form varieties. There are several varieties of horseradish, yet the horseradish never bears seed. There are innumerable varieties of pineapples, yet the pineapples never bear seed. There are several varieties of top onions, yet the top onion never bears seed, and so on, we can enumerate a number of flowers propagated vegetatively always, yet which run into variation and these variations are perpetuated and made permanent and handed down from one generation to another.

We might quibble over that term "generation," I suspect we can find that word more properly used, yet we need not go into a discussion of that, even with the plants that are propagated vegetatively. I have cited all these examples, because I most thoroughly believe in the practice of plant selection. I believe it is one great means by which we may improve our plants. I admit that there has been a great deal of fraud practiced in regard to pedigree strawberry plants; I greatly regret that the matter has come up in the last two years in the way in which it has, to check the growing opinion among fruit men that we can improve our plants by plant selection, even though we propagate them always vegetatively.

Mr. Brackett: I have been in the fruit business all my life and in the propagation of trees, and I will say this, that I do not think that the old Baldwin apple that has been probably fifty years in cultivation has ever been improved. I think the Baldwin apple is a Baldwin apple, just as it always has been. I think the old Rhode Island Greening is just the same as it was fifty years ago. I do not think you can take one

part of the original tree, which we do when we originate a tree,—we take one part of that tree and graft it only as a portion of the same thing carried right along, by grafting it onto other stock you have not changed the nature of that tree at all, and I do not believe you are able to change the nature of that tree by putting it into another stock, I think you have to have the same tree identically. You may change it, but I do not think there is a man in the house that thinks that if you take two Wealthy apple trees, or Duchess apple trees, one of them growing in the South under the worst circumstances, never had a crop, never had grown apples except under cultivation; take another grown under the most favorable circumstances, large, nice apples, take a scion of each one of those trees, graft them on another tree, and I do not think there is a man that will contend that two apples obtained from those two grafts would be any different. They would be identically the same. But this pedigree business has been taken up, in my opinion, by men who are after “suckers,” and they are catching them.

Prof. Beach: I enjoyed exceedingly this practical presentation of this subject by my friend Crawford. It is, I believe, the strongest presentation of the subject from the view point of a practical man that I have ever heard, and I agree wholly with the main points that he has made, so far as practice is concerned particularly with reference to the strawberry. At the same time I cannot agree with him that the man who originates a new variety has done the same thing in kind as the man who has written a book and handed it over to the printers, and that multiplication of plants by sectional propagation, that is to say, by taking a piece of plant and propagating it is the same as multiplying books by a printer. I say I do not agree with him, because I have evidence that does not agree with him and so have you. I believe for the practical grower of strawberries, as for the practical grower of carnations the best thing to do is to find the best varieties and hold to your faith in the permanency of those varieties and propagate them. But at the same time, those who go into the subject and make a study of it surely will find evidence that there do come in variations in those varieties when they propagate them. My friend spoke of the Baldwin apple. Now, as a matter of fact, I was born in the Baldwin country and

have lived there for a great many years, and I know that there are differences in the Baldwins that are propagated; we recognize the Blue Baldwin or the Gray Baldwin as different from the Red Baldwin and so, too, with regard to violets. Prof. Hedrick spoke of the violets in their greenhouses in Michigan, they will find the same thing mentioned by Dr. Galloway, in Washington, in his little book in which he shows that they increase in ratio of three by making selections of the plants used in propagating, a case entirely analagous to the propagation of strawberries. So we might split hairs over the fine scientific points in regard to this article, at the same time I want to indorse the general spirit of it. I believe it presents the proposition in a sound, practical way.

Prof. Hedrick: I would like to say one word. I fear, in following Mr. Crawford and in speaking rather vigorously in favor of plant selection, I may have left a wrong impression. I am not here to defend pedigree plants as sold by many nurserymen. I feared my remarks might be construed by some as being uncomplimentary to Mr. Crawford. Not a bit of it. I greatly enjoyed his paper, and I think that his position in regard to the pedigree plants is a good one for the general grower of plants and to follow in purchasing plants. But I do want most emphatically to controvert what has been set forth as to the value of plant selection to a grower who wants to go ahead and select plants as they should be selected, to put in practice the principles of plant selection as they are applied by florists, as they are applied somewhat by animal breeders and as they may be applied by the fruit growers.

Prof. Sandsten: Mr. President, I should not talk on this subject were it not for the fact that my name was mentioned in Mr. Crawford's paper. I heartily agree with Mr. Crawford's contention on plant breeding, and I say with the gentleman, I deprecate the stand taken by strawberry growers in calling them pedigree plants, but I do not quite agree with Mr. Crawford on his idea that plants do not vary. Now, the variability of plants is one of the very foundations of scientific horticulture and plants are very susceptible to environment or the different environmental conditions, such as soil and temperature and rain fall, and the fact is that we should look upon plants not as a collection, but as individuals and even go so far as to look upon individual buds as individuals and

there is a great deal in selection. It is a selection and not a breeding, and we can improve varieties by selection.

Mr. Kellogg: This topic of pedigree plants is one that we are all interested in. Now, speaking as a member of the nursery fraternity, if the variation of plant buds is sufficient to warrant us in stating that there is an increase in productiveness or other desirable qualities by plant selection or bud selection, would it not be true that those who have been engaged in the production of trees and plants for a dozen or fifteen years would have produced a variety or strain which they would claim would be superior to any other and that those who are now producing the trees in this country would have strains of the Duchess apple that would be as many as the sands of the sea, and I believe the paper covers the ground ground entirely and that a variety once established is established for ever.

Prof. Sandsten: I take exception to that, I do not want to be arbitrary, but I take exception to it, and I will show you if you will come up to the green house that we have plants grown from seeds in three generations, giving us different varieties through the seed, that is just simply variation by environment.

Mr. Goodman: I want to indorse every word that friend Crawford said in regard to the nomenclature in which the term "pedigree plant" is used, because over fifty times a year I am called upon as Secretary of our State Horticultural Society to answer the question whether pedigreed plants can be obtained. I say, no, there is no such thing as pedigreed plants, because pedigree must come from seed the same as Mr. Crawford has outlined, strictly, that is correct. But I must take issue to a certain extent with him on the idea of plants always being the same. We have planted, during the last twenty years, something over half a million of apple trees in our orchards and of all those half million of apple trees a great many have come into bearing. We have in places two hundred acres of Ben Davis or Jonathan together, and I can point you to the individuality of many of these trees, one as nicely distinct from the other almost as if they were grown in a different country and sometimes so much so that both in quality and size and color it would strike you at once as something peculiarly individual, and I say, there is individuality in

every tree which we grow that is worth paying attention to and that individuality of the tree I say is worth propagating, if it is what we want, and we have during the last fifteen years made a selection of our Ben Davis, of our Gano, of our Jonathan and our Grimes Golden, and Ingraham, and we have selected for a certain type, not for the largest, but for a certain type, and do you know that those varieties, those types, planted and grown we find maintain that individuality in our orchard tree, and that that orchard tree that is so propagated and so cared for, just like the rest of them, is worth today twice as much in our orchard as are some of the indiscriminate propagations which we had. Now, I do not mean by that that this is done generally, and you can not go to a nurseryman and ask him to do this thing, because they will not follow it closely enough. Just the same, as many of these experimenters have come to me about the strawberry question, saying, I have procured strawberry plants from such a plant and from such a man, he sent out pedigree plants and compared them with my own, it is not a fair test. I do not know how correctly those pedigree plants may have been selected. whether they have been correctly selected for that type which you want for your ground and you will take his idea of that and taking your plants that you are growing, it is not fair. But you take those varieties and make the selection yourself for ten years and you will get an individuality, a type of variety that certainly will vary very much, and it will reproduce that variation in the plant itself. And I want to call attention also to one other point. In our Experiment Station at Columbia, we met with the same violet plant. We propagated from one violet plant, one sprout that came from one plant that came from a certain number of seeds and we took out of ten plants which we had selected one that produced the least number of blossoms; we took out of those ten plants one that produced the most blossoms and then we propagated from each one of these plants again and we selected from one of those that produced the least number of blossoms each time and from the other, those that produced the most blossoms each time and we made a greater variation than Prof. Hedrick spoke to you about, one to three, we made a variation of one to five, that is three propagations removed from the seed. I am sure, Mr. President, that there is just as much individuality in the

trees of my orchard as there is in you and me. We are men, but your individuality is entirely different from mine. Do you know the case of the old Baldwin apple up here in the East where a man sued the nurseryman after he had planted twenty acres of Baldwin trees and they all came into bearing, sued the nurseryman because they were not Baldwins at all. He did so, and yet they were Baldwin apples, but they were so immature and so poorly colored that the man hardly recognized them and all the neighbors said they were not, but when they came to be examined, experts went there, they were found to be real Baldwins. That was one case where the offshoot had gone so far away that it caused a variation and that variation continued, so I believe there is a principle that we ought to follow out, and it will pay us as practical fruit growers to select the best that we can of each type of fruits that we grow and propagate from them, and it certainly cannot do us any damage, and I pay nurserymen now that will grow the trees for me. I have my orchard trees marked every year, those that give the best color, the best quality, those that are the most productive of any trees in the orchard, and every year we go through with the nurseryman and we mark those trees that give those qualities which I want, and I have him propagate those, and I pay him twice, sometimes three times as much for the trees grown that way from my own planting. Now, it certainly can do us no harm to continue this matter, and I am sure, as far as I am concerned, I am positive it is very much of an advantage in the improvement of our fruit trees and also in other lines.

Mr. Brackett: Is it not true that all varieties of potatoes that we have originated and propagated from the tubers, not from the seed, have degenerated and become comparatively worthless varieties instead of being improved from the first quality?

Mr. Goodman: Never, sir, when the principles of plant propagation are followed continually, never; but because of neglect and because of bad environment and bad fertilizing they have done so. But if you will select carefully the very best type of every one of those things for years, and I tell you they will not deteriorate.

Sec. Cranefield: I have hesitated to say anything on this subject, because I am not well informed, but I cannot refrain,

now that the discussion has taken this turn in regard to potatoes, I can give you something of the experiment that was conducted by the late Prof. Goff in this line. I helped with the work, carried the detail of the work, and I hesitate to give you the results lest you should not believe it. Several years ago Prof. Goff started an experiment in this same line of selection from a field of potatoes, selecting from the best hill, and from the poorest hill, carrying that through a number of years, breeding up and breeding down, and there was a gain of 180 per cent in favor of the best. A plant is not a fixed entity, but a plastic body, and by selection and by manipulation the horticulturist is able to do with that plant almost anything he pleases. He cannot make a potato from a pumpkin, but he can make something from the potato that will almost resemble a pumpkin in size. And not only is a plant an individual and a plastic body, but every bud on a tree is an individual, and by selection of certain buds we can obtain what is practically a new variety. Why, if plants were fixed entities, where would be the progress, except perhaps along the line of seed selection, no one denies that it is true, that is the only plant breeding. I also confidently believe that nine-tenths, or a larger per cent of this talk by nurserymen about pedigree plants, is humbug; I do believe, on the other hand, that it is possible by selection of strawberry plants, certain buds from a plant, certain runners, that we may improve the quality, and if we were to select the following year from that selected runner, we will improve still further, and we will have what? Not a field of pedigreed plants, but a field of plants of new variety which the nurseryman will be fully justified in putting on the market as a variety.

Mr. Hatch: I would like to put myself on record as a practical orchardist in saying that there is an idea in this individuality of orchard trees that is worth looking into. I have observed the thing for two or three years. I have trees under the same environment, same variety, one tree would be worth almost double what the other would be. It is a self-evident proposition with me that if you take a graft from that best tree and continue on that line, you would certainly do something for the improvement of the variety. I want to say another word about pedigreed strawberries, I had a little experience in that line. One of my neighbors got plants from

the man that started it over in Michigan. She took them out and she said to me, "If you want those plants, take them." I set them at the lower end of a bed where the soil was in better condition than where another variety was planted, but last year, while the other plants were bearing there were no berries at this lower end, and those were the pedigreed plants.

Mr. Underwood: As a nurseryman I would like to say that in the propagation of apple trees, for example, taking the Wealthy apple—up in our country we propagate more Wealthys than anything else—and we read in the papers that the tree man should propagate these trees from the bearing orchard trees, and I will say that that is an impossibility, it cannot be done in a commercial way. But I want to ask this, supposing we propagate Wealthy apple trees for a term of ten or fifteen or twenty-five years, taking the wood from the nursery tree, never taking it from the fruiting tree, using that same wood that we have in the nursery, as is done in most nurseries, what will be the effect? If this bud variation theory is correct, at the end of fifteen or twenty or twenty-five years, will the Wealthy apple be the same apple, or is it going to be a different apple? If there is going to be a variation made, will it be a better or a poorer apple, can that be answered?

Mr. Beach: I want to say just a word on this question. I take it in that as individuals, where you do not make a selection, the result would be what you would expect, an indiscriminate selection of the bud. That is entirely different from seeing some tree going into fruiting that has particularly desirable features that you wish to perpetuate, then going to that tree, taking and propagating the wood from that tree, then you are not sure that you are going to get that reproduced, because that variation may be due to the environment. But if you propagate as our friend Goodman says he has done, and find that under propagation it holds, then you have a distinct step in advance. Now, you take, for instance, the case of the Gano apple, it is right along the line this gentleman has spoken of. I was talking with Mr. Gano, just a few weeks ago, he declares they do not know where the Gano came from, except the tree was planted in the orchard with Ben Davis trees. My opinion is that it was simply a bud sport of the Ben Davis. Take the trees in the nursery, they are so much alike, it is almost impossible to tell the difference, the difference is

in the coloring of the fruit. That may answer the question in part.

Mr. Underwood: Here is what I am trying to get at. We are growing Wealthy apples in quantity, we know that they are the true Wealthy apple, we are sending them out all over the state and they bear within a few years and we know that we have the true Wealthy apple, but the question is, whether in propagating them, not from orchard trees, but from nursery trees, are we maintaining a fixed variety, or are we aiming at something that will be different in a given length of time? Will the Wealthy apple be true, as we are propagating it, in twenty-five years from now?

Prof. Beach: It will be the true Wealthy twenty-five years from now. There will be some slight variations perhaps that you will not notice. Some of these variations are so slight that unless we study them as any breeder must study them, we might not see those variations, but we would have what would pass for the Wealthy apple. But, if I were an orchardist in Minnesota, I should buy my Wealthy apple trees of you, or some other good stock that you have that is hardy, and then I would go to a bearing tree that had the particular type of Wealthy that I most admired, and that was worth the most to me, and would take buds and would bud over every tree that I got from that particular type in the hope that I might get something better than you could give me. You, as a nurseryman, cannot do that, that is what the orchardist must do for himself, and I am very glad the orchardist is doing something for his own salvation, the nurseryman cannot do it all.

Mr. Street: This forenoon there were very few to take the part of the commission man; this afternoon there is hardly anybody here to say a word for this man that I believe has done more for the strawberry business in this country than any other man, and I would be ashamed of the Wisconsin report if there were nothing said in his favor. I want to ask this question, is there a man in this country that has done more for his fellowmen in the strawberry business, getting them to do more cultivating and taking more care of their strawberries than R. M. Kellogg?

Mr. Crawford: I believe just as the gentleman does, I believe R. M. Kellogg has done more to advance good strawberry culture than any other man in the United States, and I

have been sorry all the time that I was investigating this question that I have seemed to be opposing a man who has done so much. Now, I have had no fight with R. M. Kellogg when he was alive, and I have not not after he is dead. He was a friend of mine; he has been days at my house, a man that I liked very much, but I do not believe in his theory, but I want to say that I think R. M. Kellogg did more for strawberry culture than any other man that ever lived in this country or any other country.

Mr. Moyle: I am glad that these last remarks have been made. You know I am a nurseryman, and I got my dose this afternoon with the rest of the crowd, but I look at it like this: You know we nurserymen have to deal with the subdued tenth of humanity, from the nurseryman's point of view, and the result is we have to bring up before them some vivid picture whereby we can get their attention attracted so that they will plant and grow nursery stock, and Mr. Kellogg struck the happy thought in introducing strawberries under this system as pedigreed plants, and I am satisfied to-day that people thought they got something better than the ordinary and took better care of them and consequently they got good strawberries, and in the long run it was a good deal all around.

Mr. Periam: That does not touch the question of pedigree at all; it is the fixing of an impossible word upon the propagation of plants. You will concede there is no such thing as a pedigree in plants from seeds or bulbs, you have got to have the two individuals to start with. It is the same as the word "thoroughbred," as applied properly to the racing horses in England and America, and the word "thoroughbred" as applied fallaciously to the Short-horn cattle of America and England. There is only one thoroughbred animal in the world, that is the English racing horse. The same proposition holds good here and the use of the word "pedigree" is very unfortunate, as it is a word that is an impossibility in horticulture.

THE PEWAUKEE APPLE.

A. J. PHILIPS.

It was first discovered by George P. Pepper growing in the village of Pewaukee. From its surroundings and the appearance of the tree Mr. Pepper came to the conclusion that it was a seedling of the Duchess, fertilized by some winter variety perhaps the Jonathan or Northern Spy. It was first exhibited at a Wisconsin Winter Meeting in 1872, and by the vote of the society in 1873 it was placed on the commercial list of apples, where it remained until it was well tested all over our state, when it was dropped by the same voters, largely who placed it where it was. It has had a varied career. We older horticulturists had great faith in it for two reasons. First, its good quality and fine appearance of both tree and fruit; second, the environment that first brought it to our notice, having its first introduction at the hands of that noble man, George P. Pepper, a man I can truly say was as unselfish as any I ever knew. The writer had spent much time with him at his home, at many meetings in our state, also at meetings in Minnesota, in Iowa, in the city of Washington and I never heard him say a harmful word against any man engaged in the same business he was or do a selfish act in the way of refusing scions to anyone; he was broad, a fitting example for all of us. My first visit to him was to see the Pewaukee apple in his own cellar and see the tree in 1873. I had seen the fruit in Madison and fell in love with it. I bought and set fifty trees. I was not alone, others were captivated by it. Such men in our society as our tried and true friends, J. S. Stickney and A. G. Tuttle. Each bought and set one hundred trees of it. The latter in recommending it said during one of our sessions in the seventies that he believed it was our coming winter apple for it was as hardy as the Duchess and good in quality as the Rhode Island Greening. I have heretofore said that it was dropped from our lists after being tried but it never received its thorough Black Eye and it made Uncle Pepper almost cry. After one of our trying winters Tuttle found his trees all dead and after Mr. Stickney found that on his soil it would not hang to the tree long enough to mature, he discarded it. I showed the largest specimens of it at the old Cold Spring state fair that I ever saw, three of them weighed over a pound each and I am safe in saying that if Uncle Pepper

brought one of his Milwaukee German friends to my table to see those apples he brought over one hundred. It is still reported as doing well in a few places, in both Canada and the United States. When we decided in the early nineties to set a trial orchard in Marathon county for the benefit of planters all over Wisconsin, and more especially for the small farmers on the cut over lands in the northern part of the state, we appointed a committee of three of the men of the largest experience in apple growing in our state to select suitable varieties. I yet have their report and not one of the three named the Pewaukee. So I planted none there, though I planted some that have proved no better.

Gentlemen of the convention as circumstances prevent my being with you the first time in 22 years, I now leave the Pewaukee tree to your tender care and ask what will you do with it. I have introduced this subject as briefly as I could.

DISCUSSION.

Mr. Moyle: A gentleman just told me that the original Pewaukee tree is still alive and about ten inches in diameter, a very large tree, you see. It is down in Pewaukee where Mr. Peffer lived. I have been told that Mr. Peffer sowed the seed of the Duchess of Oldenberg, and from those seeds he grew the Pewaukee apple. Mr. Peffer was one of the forefathers of horticulture in our state; I never knew him, he passed away before my day. Now, there are none of us infallible, and our good old forefathers were enthusiastic seedling growers, and the result was that often apples were brought to the society and introduced and put upon the market as something remarkably hardy and the quality the best and they were going to make it possible for us to grow apples all over our state, and the Pewaukee was one of those apples that have been propagated extensively and planted and grown not only in our state, but in other states, and at the present time it seems a reaction has taken place and the horticultural press have taken up the matter and tell us the Pewaukee apple is no good and our good horticultural fathers had poor judgment; could not tell a good apple when they saw it, and in their enthusiasm they forced his apple upon us, and to-day it should be discarded, planted no more; that we have other varieties that are much

better and we are here this morning to discuss this matter and determine whether this judgment passed upon it is correct.

Now, I want to say this morning, that the Pewaukee apple in quality and the tree in productiveness is as good as any Wisconsin seedling we have, with one or two exceptions. Compared with the Northwestern Greening or the Wolf River, I give the Pewaukee the preference, remember, as to quality, productiveness and from a dollar and cents standpoint the Pewaukee apple will produce more market apples, bring more in the market for a certain number of years than either of these other two great Wisconsin seedlings, Northwestern, Greening or Wolf River. The Pewaukee is one of the most productive apples we have. I have seen barrels and barrels hanging on trees that were twelve, fourteen to fifteen years of age, in fact, it bears itself to death, that is the great fault of the Pewaukee apple, it is so productive. As to the hardiness of the tree, it cannot be called a hardy apple. It was introduced in this society as a hardy apple, they thought it was so because it was a seedling of the Duchess of Oldenberg, but in this state it has not proved so hardy as the Golden Russet in Racine county, so it cannot be recommended in Wisconsin from the standpoint of hardiness, but if you are growing for dollars and cents and have a soil that will color up the Pewaukee, the Pewaukee will color up and keep nice enough so it will be a profitable market apple. I do not grow it extensively in our locality, because we have better apples, but if I were going to plant out a large commercial orchard, I would not hesitate at all to plant largely of the Pewaukee apple. As to its keeping qualities, I should say that if the Pewaukee is picked when it is still somewhat green, it will keep as well as any apple, but if allowed to ripen on the tree and become mellow, it will not keep. So I would say that we should not discard the Pewaukee apple in localities where it succeeds.

Mr. Periam: I want to testify in relation to one point. I had the pleasure and the satisfaction of being very well acquainted with Mr. Pepper for a long series of years and if Mr. Pepper testified that that was a seedling, he was a man so thoroughly honest, so careful in his work, that if he said that that is a seedling of the Northwestern Greening or whatever it may be, it is a fact, and it must be accepted.

Mr. Sperbeck: As regards the Pewaukee apple, my experience with that has been this—the trees are too tender in our locality. In Southern Wisconsin and Northern Illinois I think they can grow nice apples. When I was at the meeting in Illinois they had some fine specimens, but with me the trees are not hardy enough, and as far as the keeping quality is concerned, I think it is fairly good. We believe that in Northern Wisconsin that it is not the apple that we should put out, and they stand no comparison with us with the Northwestern Greening for a commercial apple.

Mr. Foley: I cannot agree with my friend, Mr. Moyle. I cannot compare the Pewaukee at all with the Northwestern Greening. I think the Northwestern Greening is one of the finest apples we are propagating to-day in the Northwest. Now, I have grown the Pewaukee and several other varieties in the nursery row, and they are not hardy with me. I have a large orchard about six years old, and the Pewaukee is not hardy in the orchard, and I think in our locality the Northwestern Greening is far superior in both quality and hardiness.

Mr. Menn: I am speaking strictly for the western part of our state. I set my first Pewaukee trees in the spring of 1884 and 1885. The trees grew very nicely until they came into bearing; after bearing one or two crops they showed signs of failure, with the best care, and it was but a few years later that the trees were dead. Now, from that time on I never set another Pewaukee tree. They were productive at the time and the keeping qualities were very good, but, as Mr. Moyle has stated, making comparison with the Pewaukee and the Northwestern Greening, I cannot agree with Mr. Moyle; the Northwestern is far ahead in our section of the country of the Pewaukee. Now, I want to say that those trees that I set were set on very good apple soil, up on high ridges that we find in the western part of our state with the clay, gravel subsoil underlaid with limestone, so there is no lack in fertility. I have also seen these trees grown on light soil near Sparta. In fact, two years ago while we were gathering fruit for St. Louis I came to an orchard on this light soil, where I found a Pewaukee tree that was loaded with as fine fruit as I had ever seen. I climbed into that tree and selected what I wanted. The tree appeared to be perfectly healthy at the

time. A year later the man that I got the apples from stopped me on the street in Sparta and accused me of climbing into this Pewaukee tree and killing the tree; the tree had died after that fruit had been picked. Now, I have observed that on other places in the western part of the state, that the tree is not hardy, and for that reason I would not recommend the tree for the western part of our state.

Mr. Marshall: I do not know anything of the hardiness, for or against the Pewaukee apple, but I don't think there is any question but what there is more money to be made off the Pewaukee apple in a section of country within a radius of ten miles around Milwaukee than all the other apples put together. I have driven through that country two or three times, gathering apples for Buffalo and St. Louis, and I do not think that that is an exaggeration.

The President: I wish to say this, that my experience with the Pewaukee apple is quite limited, it is merely observation; I do not grow it. The Pewaukee apple with us is not inclined to be very hardy, it blights somewhat. It raises good apples, and I believe, as Mr. Marshall has said, that there is a part of our state where the Pewaukee succeeds well and should be grown. I believe also that there are parts of the state where it does not do very well and does not live very long, and that it blights, and yet the question is, what shall we do with it. I believe we ought to retain it, with the understanding that there are certain sections in the state where you can grow it, and there are other sections where you cannot grow it successfully.

Mr. Toole: In my experience in collecting fruit I had a chance to see a great deal of it. We have in our country some people who would like a good chance to stand up here and champion the Pewaukee and others are ready to condemn it. As near as I can observe, the great trouble with it is—and that gives us this conflicting testimony—its peculiar liability to being infected with blight. Almost every year our Tallman Sweet has twig blight, and never hurts the tree, but it seems to me the blight is apt to strike the Pewaukee in the branches; you will find all at once the canker in the branches and crotches and away your tree goes; and perhaps a close study might reveal that some situations are not affected that way, but still those who have been around and have seen it

and have seen the way we get along with other trees, they naturally feel shy of planting that particular variety when they are safer with other kinds.

Mr. Kellogg: In the neighborhood of Milwaukee and around Pewaukee, where this apple originated, it does not make any difference what we decide to do with it, people down there will make their own decision. You cannot drive the Pewaukee apple out there with the State Society or Pomological Society or anything else, they are bound to have it there. But in comparing the Pewaukee with other seedlings, you must not lose sight of the fact that there is a certain latitude beyond which the Pewaukee will not succeed, compared with other varieties. We have yet to raise the Northwestern Greening in any manner to satisfy us as an orchard tree, but at the same time I do not feel like condemning the Northwestern Greening, and I believe it succeeds in the northern sections where the Pewaukee will not.

Prof. Hedrick: Prof. S. A. Beach, now at Ames, Iowa, unfortunately is not in the room. He has gotten out in the last few years a magnificent book on the apples of New York, in which he goes into the history as well as the description of all the varieties grown in that state. The Pewaukee is very largely grown in Northern New York, in the St. Lawrence valley and Champlain valley. In looking up the history of the apple, he wrote a number of men here in Wisconsin, I am not able to give you their names; I am not sure but the originator of the apple is one of them, and in his correspondence he got together information which led him to feel sure that the true parents of the Pewaukee—every apple must have two parents, of course—are the Duchess and the Blue Pearmain, both tree and fruit have characteristics of these two trees, and grown side by side, with the Duchess and Blue Pearmain, you will find it is a pretty fair cross between the two, its characteristics are intermediate between the two; in tree growth particularly it is very largely a Duchess, in the marking of the fruit, in color, it is very largely a Blue Pearmain, and Prof. Beach sets forth in this book I have mentioned, that in his opinion, after having studied all the evidence that he can get, that it is a cross between the Duchess and the Blue Pearmain. I do not know that this little history makes any difference as

to the value of the apple in your state, but I thought you might be interested in it.

Mr. Smith: I believe that Mr. Moyle's statement will appear rather contradictory. He said the Pewaukee bears itself to death in the orchard; they were all dead and gone before others, but he does not say what killed them in the orchard. Then later he says they are not hardy; then again, he said that if he would set an orchard he would set quite largely of the Pewaukee. I would like to have Mr. Moyle explain his position a little better; it will certainly show very contradictory statements in our report.

Mr. Moyle: I reasoned along this line—the Pewaukee will start very young and bear heavily and bear themselves to death. The vitality is weakened by bearing these heavy crops, but, on the other hand, during the life of this tree, it has yielded more and paid more than the other trees that are still in the orchard.

The President: I think, perhaps, we will not get any better conclusion than we have already arrived at, and I would like to know whether you want to take an expression of what we will do with that Pewaukee apple?

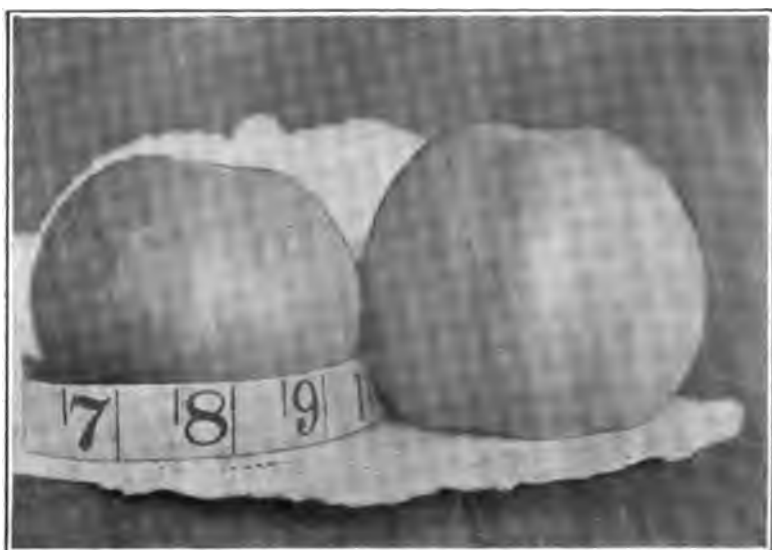
Mr. Kellogg: I would move that the expression be taken whether we shall retain the Pewaukee for certain sections of the state or not.

Mr. Marshall: We have an orchard committee, I think that perhaps it would be more proper that the matter be turned over to them and be more carefully considered than to be brought up in this way, before any expression is made.

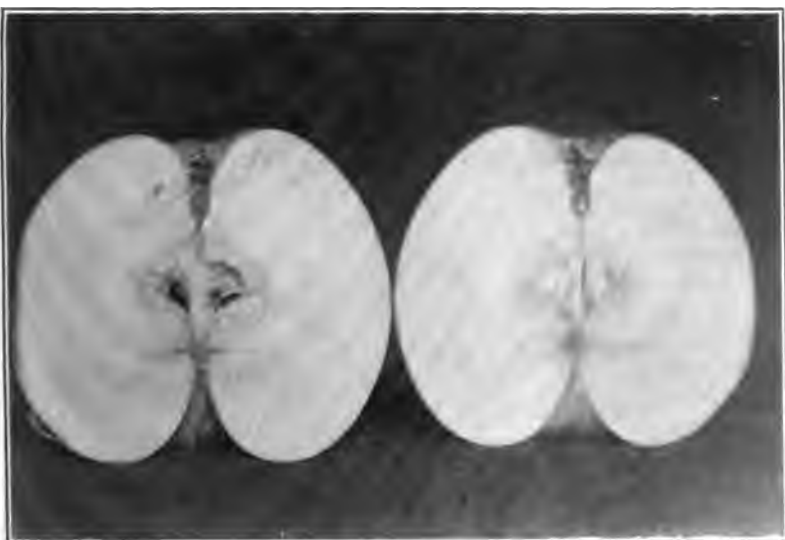
THE ZETTLE SEEDLING APPLES.

D. E. BINGHAM, Sturgeon Bay, Wis.

For about fifty years Mr. Joseph Zettle was a resident of a farm near Sturgeon Bay in Door county. From his ancestors in Switzerland he inherited an intense love for fruit trees. During his life he procured and planted every kind of fruit tree that



Lily, one of the Zettle Seedlings.



Seedling Apple from Richland County, exhibited at State Fair, 1905, by John Kels, Ithaca, Wis.

he could learn about that he believed to be sufficiently hardy. He also grew many seedlings from which he selected the best and grafted into root sprouts and other trees planted in his orchard. Of all he fruited he regarded two varieties as quite superior to several thousand trees in his orchard. One of these by suggestion of Mr. Hatch he named the Bellflower as it is an apple of that type. This variety is a Duchess seedling probably crossed with Antonovka, several trees of which are in his orchard. In habit of growth the tree is perhaps more like the Antonovka, especially in its early and wonderful fruitage. In robust and sturdy parentage certainly no tree could boast of hardier ancestors. The fruit is large, yellow and about the same season as the Antonovka.

The other variety which Mr. Zettle esteemed most highly he named the Lily after one of his daughters. As a seedling this variety is certainly unique—its origin being a Duchess seedling; that is, the seed producing the Lily was taken from a tree that was itself a Duchess seedling. In fruit the Lily is rather larger than the Duchess with a smooth fine skin marked with stripes and splashes of red some what like the St. Lawrence which it resembles somewhat in shape. Possibly its parentage may include the St. Lawrence but the possibilities are greater for its being part Pewaukee of which there are many trees in Mr. Zettle's orchard near his Duchess. In quality the apple is of finer texture than the Duchess and a little later in season.

Perhaps right here is where your interest will begin to lag when you have learned that both of these are fall apples. And you may think that with the multitude of varieties we have of that season it is imposing on good natured but suffering horticulturists to ask them to accept two more fall seedlings from Door county. It is, however, at this point my enthusiasm begins and I ask your patient consideration of what I have to offer. My enthusiasm for this variety begins in the tree itself. Not only has it the splendid foliage of the Duchess, which is not surpassed by any known apple but its style of branching is far superior. There is a decided improvement in the number of limbs and a consequent increase in the fruiting surface. And above all it has feeding powers—a self hustling root power—if you will admit the expression that makes it live, grow and bear fruit as very few other kinds even approach. This tree in the

orchard can be highly appreciated when it stands up strong and vigorous while such kinds as Russetts and Newell are broken with moderate crops and common summer winds. Indeed if there is any variety that is a full fledged discouragement in this regard it is the Newell, which in spite of training and pruning is always making a bad show in the orchard.

There is one point in apple culture upon which we all agree and that is hardiness. Another point I wish to make is that for hardiness the Duchess and its seedlings are among the hardiest known and for us in Wisconsin will make possible successful apple culture over a greater portion of the state than any other class of apples now known.

While these will be doubtless accepted as conclusive of these points I shall not urge the further point that we do well to bring these two varieties to the notice of the public that they may be more widely grown and enjoyed.

Our work in bringing out Duchess seedlings has gone perhaps far enough and in the production of more apples of that type we could not expect to add anything of value not now fully obtained. What we need now to do is to use these seedlings as the foundation stock upon which to grow the quality and keeping properties we so much need in our Wisconsin pomology. Right here our real work begins for apple culture progress. In the Lily we have the foundation that is the very acme of what the orchard tree should be. Now upon this foundation by systematic cross fertilization let new seedlings be produced of such apples as the Northern Spy, Jonathan, Newtown Pippin, Spitzenberg, etc. These apples of high quality and excellent keeping qualities would probably be sufficient to give character to the fruit while the tremendous individuality of the foundation tree would perhaps assert itself in the new seedling trees, to retain all its desirable characteristics. Of course we could not expect a blending of traits and a gradual modification of any one feature so that while one parent has a characteristic half as good as we want and the other quite as good as we wish the new fruit should possess this feature half way between. The new fruit would take its different traits wholly from one of its parents or so nearly so as to give rise to what is properly termed "*Unity of heredity.*"

Working with the law we could at once begin the work of putting excellent quality fruits upon the hardiest and best

trees now known. This ought to give results far quicker than could be hoped for in chance seedlings and selections of variations. But this is not the work for individuals. Life is too short for that. The fate of the Freeborn collection in Richland county demonstrates this. Mr. Pepper, Mr. Springer, Mr. Zettle and others, seedling advocates, have passed away. It is the work for young men.

While this work may be properly undertaken by our Experiment Station it is one in which our society should co-operate. Our Secretary is comparatively a young man, he is familiar with the work and methods of the Wisconsin Station, and is amply qualified for the work. Let us give him the authority and the funds to begin work. If you care to do this the firm of Hatch and Bingham will gladly send some Lily trees to begin with.

In closing let me urge upon you the importance of this work. Let us co-operate with the dean of the agricultural college who has so well served us, let us cherish the memory of our co-worker and friend Prof. Goff, and further let us encourage Prof. Sandsten in his work by letting him know that in this field of producing new varieties of apples we have a work worthy of his best efforts and one that will bring honor and profit to our state.

DISCUSSION.

Mr. Menn: How old is the original tree?

Mr. Bingham: I think Mr. Zettle has trees in his orchard of this variety that are perhaps eight or ten years old. If he were alive, we could get a history of his apples, but he left no record of the seedlings or the age of the original trees and it was impossible to get an exact age.

Mr. Menn: Does it blight?

Mr. Bingham: I have never seen any blight in the orchard.

Mr. Underwood: Mr. Bingham's paper brings something in to my mind that may interest you. We are beginning to believe in our Minnesota society that our work has been falling down a little in the matter of these new seedlings, and we are going to try to mend our ways. Mr. Bingham's suggestion is a very good one and we are starting to work along a somewhat

similar line, however, with a little different method. You know we are offering a thousand dollars up there for a new winter seedling and the result has been that there are hundreds, I might say, of new seedlings being brought out every year, the same as you have in your own state, and exhibited at our annual meetings and at our state fairs, but there has been no methodical, systematic attempt made to record the experiments of these men who have given their time to it. There is the orchard of Mr. Peter M. Gideon and Mr. Dartt over in our state and of Mr. Terry, the plum enthusiast, down in Iowa, and Mr. Tuttle and a number of your men here. Now, in breeding stock they have what we know as herd books and individuals, which, carrying the analogy along into fruits would mean varieties, individuals which have made a record, are recorded there for future generations to refer to, and it seems to me as though we ought to have in each state some systematic effort to record these new varieties that come up, give their history, boil it down and put it into a convenient form for experimenters to have before them. In this way we could avoid this treadmill work, each new generation coming along and doing the same work over that their fathers had done before them. We have established up there this year what we call the Plant Breeders' Auxiliary to our society, having for its main object the recording of new apples as they come out, so that all members of the society may be able to have a concise record of what has been done in years past.

A Member: I understood the apples on the desk were grown on the farm adjoining Mr. Hatch's, and I would like to have a statement from Mr. Hatch as to whether he knows what is called the Hank's seedlings?

Mr. Hatch: Those trees were put out about forty years ago, about a half dozen trees. The man got the Duchess and some crab apples. The son lives on the farm and this tree stood where one of the original trees stood. Whether it was sprouted from the root or whether he planted a seedling the son does not know, but we know that it is a pretty fair apple of the Alexander type and that it is strictly hardy. The tree has never in its whole life been pruned or sprayed. It bears annual crops, if my memory serves me right it bore fifteen bushels this year and thirty bushels last year. I have had the most expert men, men of national reputation, down here, examine the fruit and they all

pronounce it a seedling, different from anything they have ever seen.

Mr. Burnham: It was suggested it was the King.

Mr. Hatch: No, I do not think it is the King at all. I would like to say one word in regard to the Freeborn seedlings and the importance of systematic recording of the work of the raising of seedlings as suggested by the gentleman from Minnesota. Mr. Freeborn raised a great many seedlings of seeds of different varieties and graded them according to the varieties that the seedling is obtained from, but when he died, the whole thing stopped right there, all his work was lost. If he had made any progress at all, it was lost at his death, so you see the importance of continuing right along. Now, in my opinion there are only two lines of progress that we, as orchardists, can make along the line of apple growing. One is in breeding from individual trees, something that was talked about last night, and that is an important thing. We have in our orchard one tree in particular of the McMahan that in speaking of the tree we always say, "Why, that good tree," and it is good, it always grows nicely and if there is any crop at all we always get a big crop off that tree, and I have a Golden Russet tree that we always speak of as the Golden Russet tree. Now, if we take scions off those trees and graft them and then get them to fruit and select the best of the lot, it seems to me as if there would be progress along that line of work, breeding from the individual, and then along the line suggested by the paper in breeding from the seedling, selecting the best seedling and continuing along that line, we can hope for progress I am sure, and this is practical. We cannot all be plant pollonizers and breeders along that scientific line, we do not have the time, and we do not all of us have the talent to do it and the opportunity to do it, but in these very lines we can do it and continue right straight along.

Mr. Goodman: You use a wrong expression; the one is selection, and the other is breeding, and that is the reason we got confused. You make selections from your trees and that is the word you want to use, we do not want to use the word "breeding" in that connection, but "selection" and continued selection. We get the wrong impression if the word "breeding" is used.

THE MONROE COUNTY SEEDLING.

J. J. MENN.

In the fall of 1904, the first week in October, while driving through the county in search for apples for our Wisconsin exhibit at St. Louis, I stopped at the farm of Cal Day, in town of Wellington, Monroe county, his farm and 10 acre orchard being located four (4) miles east of the Kickapoo river on top of a high ridge.

In going through the orchard with Mr. Day I found 50 per cent of his trees "Seedlings," the balance being top worked. The crop of apples being very good, but prices very low. Mr. Day had made no effort to sell his fruit and the result was that the ground under the trees was covered with rotting apples.

Being more interested in the seedlings than our standard varieties, my eyes were constantly on the seedling trees that he had pointed out to me, until we came to a tree where at least two bushels of the largest and finest apples seen in the orchard were on the ground, some were still on the trees.

I asked what have you here? He said this is a seedling of the Duchess, it is the best apple and tree I have in the orchard, I have only one more top worked tree of this variety. The trees bear a good crop every year.

I have never seen signs of blossom or twig blight.

Our cold winters don't seem to injure the trees. I have been on this farm since 1856.

Planted my first seeds that fall, which I brought with me from the state of New York, have been experimenting in root grafting and top working, cross pollonization ever since, in hopes of growing some winter apples, superior to what we have.

This apple is far superior to its parent "the Duchess" in size, quality and keeping quality.

I asked Mr. Day to give me the history of the tree, which he cheerfully did.

He said in the fall of 1883, I had some choice Duchess trees upon which the Utter Red had been grafted, both the Duchess and Utter Red bore heavily that fall.

I picked a lot of these Duchess and sun dried them, saved the seeds, planted them in a row that fall in the garden, a few years later transplanted these seedlings in the orchard.

In the fall of 1890 one of these trees bore two apples larger and finer than had ever before been seen in my orchard.

Ripening the last of September, the following spring, I cut a few scions and grafted on a small seedling, you see the union is perfect, after this I never cut any more scions from these trees. I neglected to propagate from that time on, am getting too old to do much more in this line.

If you think the apple worthy of propagation and can get a little out of it for me, do so, I leave it with you.

I examined both trees and found them one of the finest orchard trees I have seen. Leaves more pointed than Duchess and not quite so dark green. Bark smooth, no signs of blight have ever been noticed.

The original tree is about 18 feet high and 8 inches in diameter.

The fruit is all large, averaging in size with the "McMahan" fruit, large, roundish, streaked yellow and red, flesh white, juicy and a very good cooking and canning apple, also a good eating apple. Season September 15 to November 15.

This in brief is the history of this seedling tree. I shipped some of these seedling apples to St. Louis and requested Mr. A. A. Parsons, superintendent of our Wisconsin Fruit Exhibit, to show Prof. Taft, who had charge of the judging, to pass on the seedling; he did so. In his reply he said, a very promising new variety, propagate as fast as possible.

In a letter from Mr. Parsons, dated November 17, he says, that seedling is here yet. Now if this seedling is hardy and prolific, it is a glorious thing beyond price.

I picked some of these seedlings last fall, shortly before our state fair and sent them with others to the fair, for our society exhibit in charge of Mr. Craneheld, our Secretary. There Prof. Green of the Minnesota society saw the fruit, he wrote me requesting to give him the history, which I did, I also mailed him one apple.

His reply is as follows:

Mr. J. J. Menn:—Yours of September 16th at hand and also seedling apple, which you were so good as to send on. I took this fruit to the American Pomological Society and it was favorably commented on by a large number of prominent pomologists. I wish I had had a full plate of it as it would then have attracted more attention. I regard it as a fruit of very ex-

ceptional and high value, and if the tree is healthy, hardy and productive, I think it will be a very important addition to our list of cultivated fruits. I shall include a description of the variety in my report to the American Pomological Society.

Yours very truly,

SAMUEL GREENE.

St Anthony Park, Minn.

Geo. J. Kellogg of Lake Mills called on me last fall and after he had seen the fruit and sampled it, pronounced it one of the finest Duchess seedlings he had seen.

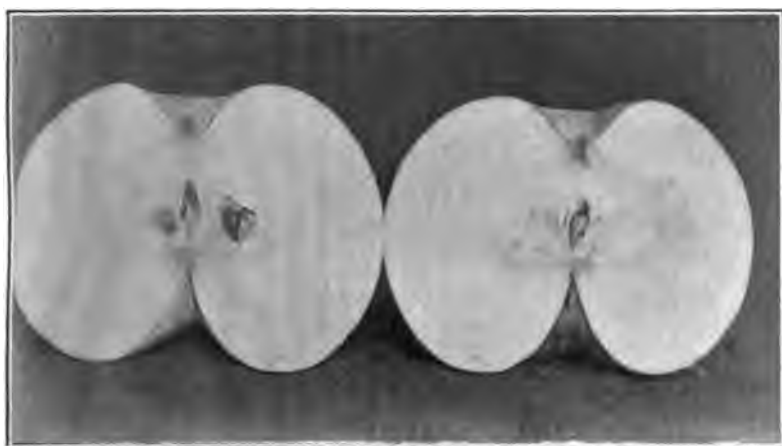
It seems too bad that this seedling was not discovered at the time of its first fruiting, if it had, many trees would now be in bearing this variety.

I would suggest that our society take up this seedling question. Many valuable seedling trees are growing all over the apple growing sections of our state, and unless we make a search for them, they will never be known.

A small amount of our funds expended for this purpose, would certainly bring good results for our state and the Northwest.

DISCUSSION.

Mr. Menn: I wish to state that I have no fruit here this morning. I had packed some, with the intention of sending it to cold storage after our state fair, last fall. I did so, but was unable to find storage at the time, and not until about two or three weeks later, and the weather being so warm during the month of October, it was a little bit too late to send them. For that reason I have no fruit here. I packed some away in the cellar, but the fruit did not keep until this time. I would state, though, that I packed some of the Wealthy and some of the McMahan at the same time, and in the same barrel and both the other varieties did not keep much better than this fruit did, the cellar being too warm. The tree, as I found it growing, is in an old blackberry patch; it had been cultivated for some time, but now had grown up to grass again. There were no signs of blight, as I stated in the paper, although there are a good many trees surrounding it that had



Duchess Seedling exhibited at State Fair, 1906, by J. J. Menn, Norwalk, Wis.

blighted to death. It shows the tree is almost immune. I have some of the wood and if any of you wish to examine it, you can do so. It seems to me, although this is a fall variety, it is a very important addition to our tree list as long as it is almost blight proof and an annual bearer, the quality being very good, and I think it is well for us as a society to look a little more after the seedlings of our state.

The Secretary: There is very little I can say on the subject, except to emphasize what Mr. Menn said. The apple of the Duchess seedling was shown at the state fair, last fall, and it attracted great attention. While I was in some doubt as to whether the Sauk county apple was a seedling, I am in no doubt in regard to this, because there is nothing else in that family of apples that at all resembles it. The fruit that was shown is nearly as large again as the average Duchess, a later apple, it keeps well and while it is a fall apple, I think it will be a valuable addition to our list of fall apples. In color and form it resembles the Duchess; it resembles it in form more than in color. It is undoubtedly of the Duchess family. When I said what I did a moment ago, I had in mind that it was not any of the other Russian apples that have been grown in Wisconsin. It is not the Duchess, it is not any other of the Russian apples, it is undoubtedly a seedling and later than the Morgan, which is a seedling of the Duchess, much later than the Duchess, about in the season of the Wealthy, or possibly a little earlier. I should say that it is an apple that we need to give a great deal of attention to, and as Mr. Menn says, I think we cannot give too much attention to the seedlings. They are found to come rarely by processes of hybridization, they are usually found in the fence corner. That is not the history of the Duchess, but that is the history of a great many of our apples.

Mr. Bingham: I would like to have Mr. Cranefield state to the society whether the seedlings that I spoke about attracted any attention in Milwaukee at the state fair. We sent them down there.

The Secretary: The Zettle seedlings did attract considerable attention from fruit men, not so much as the Duchess seedling shown by Mr. Menn, for the reason that that was possibly a more conspicuous or more showy apple. Your Sturgeon Bay seedlings are not as brightly colored as the

other, but the Zettle seedling did attract considerable attention. There were one or two of undoubted merit, one called the "Lily," and another that attracted a great deal of attention, and I wish to urge upon the members here present the desirability of sending fruit to the state fairs. I expect our exhibit there will now be an annual event. I almost implored people to send apple seedlings or anything else to the state exhibit, but we got very few, Mr. Menn responded, and Mr. Bingham, and some others. There is your chance. You cannot show your fall seedlings at the winter meeting, you can show them at the state fair.

Mr. Toole: I think our Secretary asked for an expression of opinion in regard to the value of the Milwaukee exhibit to the society. I for one, think a great deal of it, and hope it will be continued. We saw many good reasons why we should have it, one seemed to be that it formed the headquarters for horticulturists to get together. Not only were new seedlings brought forward for examination and certain varieties were brought there for naming, shrubs, etc., to be identified, and a great deal of information was brought out in that way, and I do not think that I need to say that I hope our Secretary will continue that; I am quite sure the encouragement he got there from his own observation will make it a permanent feature of this society's work.

CULTIVATION AND COVER CROPS.

PROF. N. P. HEDRICK, Geneva, N. Y.

Cultivation is as old as agriculture. It probably began in the garden which the Almighty gave Adam to tend. The very existence of domesticated plants depends upon cultivation. All man's care of plants centers around one great object—to give them more food. We cultivate to make available the food stored in the soil; by means of fertilizers we add food to the soil; we water and irrigate to bring food into solution; we thin that the remaining plants may have more food; we destroy the weeds that rob our plants of food; and we even

cut away parts of the plant, pruning, that the remaining parts may have more food. Of all these operations practiced by tillers of the soil, expressive phrase, the world over, shall we not put cultivation first? The Biblical injunction is to "dig and dung," and dig is first. First of the processes which have helped to domesticate and ameliorate plants, and first of the means we now have of sustaining and augmenting their value.

For some reason it has taken centuries for the fruit-grower to come to any degree of appreciation of the value of cultivation and not one in ten of our fruit-growers rightfully value it at the present advanced stage of agriculture. In no other phase of agriculture shall we find cultivation held of so great importance as in the branches of horticulture other than fruit growing. Could one imagine a sane body of market gardeners discussing the relative values of cultivation or no cultivation, or tillage versus sod-mulch, for onions or cabbage? Yet onions and cabbage differ but little in their feeding habits from apples and pears. That miracle of miracles, the bringing forth from a pot of soil, a plant which weighs more than the earth from which it came, performed in countless numbers by the florist, near neighbor to the fruit-grower, could never be done without daily digging about the plant.

And so, forsooth, when men in our profession should be interested in the thousand and one new problems in pomology we are still thrashing over the pre-historic matter of orchard cultivation and this leads me to say that pomology as it now is, is too narrow. For most part it consists of the description and classification of fruits with some attention to orchard operations, of which cultivation seems prominent now. With the exception of the advance in spraying and in cross-pollination, we are much where we were a century ago so far as growing fruit is concerned. We need to discuss broader questions in pomology. We should be past the kindergarten subject, cultivation. Before us are the great problems of plant life—how plants grow, how they feed, means of improving them, and the whole great subject of reproduction with its manifold problems of bud-formation, bud-control, setting and dropping of fruit, development of fruit and the other interrelationships of the sexes.

But I must hasten to a discussion of cultivation itself, though, in truth to say, it has received so large a share of at-

tention at horticultural meetings of late that I can give you but little that is new on the subject and fear that I can do little more than reiterate again and again to you its importance. The effects of tillage on the soil and on plant growth are known to all. Nor need I go into details as to methods and implements as they must vary with every condition and hence with nearly every man. Beside the necessity of cultivation, however, I must urge judicious cultivation for there can be too much of a good thing and some soils are damaged by over cultivation.

In general, the soil needs each year a thorough turning up in the spring with a plow and a shaking out now and then through the growing season with the cultivator. The aim of such tillage is to let in sunshine and air, thereby furnishing life-giving oxygen to the roots and enabling the myriads of bacteria to live and work; to conserve moisture; to unlock the store rooms of potash and phosphoric acid; and to kill weeds. The last purpose, killing weeds, is in reality the least in importance though many think of it as the sole aim of the operation. One can almost say that weeds have a use, in that as we kill them with the cultivator we serve the other ends named. Certain it is that they serve as grindstones to sharpen our wits in this matter of tillage.

A few more practical suggestions are: begin plowing as soon as the soil can be worked in the spring; cultivate at intervals of a week or ten days until mid-summer; stop when the trees have made sufficient growth otherwise the wood may be soft and unripe for winter; cultivate in such a way, for most part, that the soil is left level. It requires some skill to cultivate a clay soil well and the chief item is that the work be done at exactly the right time. There is a time between wet and dry on clay soils when the clods break and crumble. A working at this particular stage will save half the labor required at a less opportune time. Clay soil is often worked until it is too fine and when the rain comes it cements and packs and the condition is coarser than at the beginning.

The implements should be adapted to the soil and to the work. There are now innumerable good tools and one can take his choice between various clod-crushers, harrows, cutaways, weeders and so on. Tools with high handles, levers, and wheels should be avoided for orchard work. Harnesses

should be such that there are few projecting parts and the orchard whiffle-tree will save barking the trunks.

We come now to that much discussed question, cultivation *versus* the grass mulch. -

Periodically the horticultural world is startled with some new orchard treatment which promises to revolutionize current methods. Many of these new systems may be likened to the health fads which are sprung now and then on suffering humanity. The "water cures," the "back to nature" treatment, the vegetarian fad, have their parallels in horticulture. It may be that all contain the germs of truth. But fads are likely to be one-sided and to be heralded as "cure-alls" when they cure but one of many troubles. There are now several fads before the fruit-growers of the country which have in them. In the writer's opinion, possibilities of doing far more than good.

The fad in full swing now, the country over, is the so-called Hitchings method of grass-mulching apple orchards in place of cultivating them.

There is nothing new in the Hitchings system of grass-mulching orchards. At least twice before in the past century it has had a brief run of popularity. The present revival of grass-mulching orchards was started in New York, where the orchard of Grant Hitchings, under the system which bears his name, seemed to be exceptionally thrifty and productive of apples of high quality and of high color. Young trees, uncultivated and grown with a grass mulch, came in bearing much earlier than they usually do under current methods of orchard treatment. It is claimed, too, that grass-mulching is cheaper than clean cultivation. In Mr. Hitchings' orchard, the grass, supposedly blue grass, is cut several times during the season and thrown under the trees, where it is supposed to add humus and fertility to the soil and to aid the soil in retaining moisture. In this orchard grass-mulching is certainly a success.

Grass-mulching, in lieu of cultivation, may succeed in some soils, but cannot in all nor on the average soil. Deep, rich, heavy soils may grow two crops—grass and apples—but other soils will not. Again, it may be good practice to grass-mulch steep side hills or lands that cannot be easily cultivated. Under most conditions it will be found in the

long run that the grass-mulch system will diminish the growth of trees, weaken their vitality, make them more susceptible to droughts by enticing the apple rootlets to the surface; the grass will furnish hiding and breeding places for insects, fungi and vermin, and the store of plant food in the soil will be more quickly used up in the grass-mulched orchards than in the cultivated ones. Not only are the reason and the accumulated experience of apple growers against grass-mulching as a general practice, but such direct experiments as have been consistently carried out are against it.

The most complete and the best planned experiments that have come to the knowledge of the writer are those of the Woburn experimental fruit farm, conducted by the Duke of Bedford and Spencer U. Pickering in England. It is true that English and American conditions are quite different, but the relations of the two plants, grass and apple, should not be strikingly different in two sets of conditions. Their behavior should be relatively the same. The conclusion of these English experimenters should be of value to Americans. Their experiments have been carried on without interruption for the last ten years, and seem to prove that not only the evil effects enumerated above are brought about, but that grass is actively poisonous to apple trees. The following, taken from the introduction of their third report, gives the gist of their work:

"As to the general effect produced by grass on young apple trees the results of the last few years have brought forward nothing which can in any way modify our previous conclusions as to the intensely deleterious nature of this effect, and we can only repeat that no ordinary form of ill treatment—including even the combination of bad planting, growth of weeds and total neglect—is so harmful to the trees as growing grass round them." * * * "The evidence which we shall bring forward will, we believe, be sufficient to dispose of the views that the grass effect is due to an interference with either the food supply, water supply or the air supply of the tree, and that it must in all probability be attributed to the action of some product, direct or indirect, of grass growth, which exercises an actively poisonous effect on the roots of the tree."

And now in concluding this matter of cultivating the orchard. It seems to me that its importance must be known to

all. In horticultural meetings, in experiment station bulletins and in the horticultural press it has been urged year in and year out for a half century. It has been making of the great commercial orchards and its lack is the curse of the farm orchard. The grass-mulch heresy of Mr. Stringfellow and of my friend Mr. Hitchings, must not offset the good cultivation teachings. High cultivation has brought success in the past and it will in the future. In the words of J. H. Hale, the great peach grower, "culture, culture, culture, is the sure road to success while any other scheme of handling the orchard is nearly sure to lead the other way."

I want now to take up the second part of my subject, that of cover crops.

The relations which plants bear to their physical conditions, as soil, heat, moisture, and the like, are well understood in the main. Agriculture is and ever has been concerned with these relations. Practically all of the operations of the husbandman are efforts to help plants in their struggle against the circumstances of environment. When physical conditions are prejudicial, the life of the plant is a prolonged struggle against circumstances to which it may succumb, or under which attain a profitless maturity.

But plants are influenced by other factors than those of their physical environment. They have inter-relations between themselves upon which often depend their best development. Agriculture has neglected these relationships of plants to each other and has devoted itself almost entirely to plants and their environment. The agriculturist, for most part, has looked upon plants as passive, unchangeable organisms to which it was his business only to supply certain definite external conditions as food, moisture, and a foothold.

In this connection I may remind you that a generation ago it was the fond dream of the chemist and the agriculturist that an exact analysis of the soil, followed by a generous supply of any lacking elements, would result in fruitful harvests. I need not tell you that this dream has not been realized. To the contrary, we are depending less and less upon analyses of soils, and more and more upon a knowledge of plants, and especially of their life histories, as manifested in their needs, habits and relations. This is but one of the many illustrations

of how, consciously or not, we are being led to a new conception of plants, of how we are coming to look upon them as plastic organisms capable of remodeling in all their parts and of how the agriculturist must regulate all of the conditions of plant life, external and internal, if he is to realize as completely as possible the ends for which he cultivates.

What has this to do with fruit growing? The answer is that through a study of their relationships we can better determine what the vital necessities of cultivated plants are. In nature plants form communities because their necessities are the same. They are forced by their needs into companionship. So it comes that widely different species of plants often thrive side by side.

Thus, a knowledge of the association of cultivated plants, of the species and varieties that thrive side by side, would throw new light on the inter-relations of climates and soils with fruit growing. Note how the various communities formed by wild life characterize soils and climates, not alone of zones and countries, but of townships, localities, and even farms.

"Theories are fascinating," you say. "In what direction will a knowledge of horticultural floras be of advantage to fruit growing?" The catalogue of fruits mentioned could be made to show the variations of types in the regions already created; the locations of dominance of the various fruits and their varieties; locations of greatest size, highest color, best quality, and relative stability for all varieties; the longevity of individuals and of varieties in different regions; and a classification of varieties as to their likes and dislikes for various soils. A survey of horticultural regions along these lines would enable the fruit grower to specialize more closely and to plant and market his fruit to better advantage. There is no phase of horticulture of more vital importance at the present time with the keen competition that exists between different fruit regions, than the adaption of fruits and their varieties to geographical and local conditions. There should be horticultural floras established to show these adaptations.

The effects of crops and crop residues on the soil is another of the relationships of plants which imperatively demands attention. Plant life constantly changes the soil. A species may thus transform the soil favorably or unfavorably to itself as a

succeeding crop, or favorably or unfavorably to other species that may follow. Thus, a peach tree planted in the place of a perfectly healthy peach tree, ordinarily does not thrive. But few farm or garden crops grow well, succeeding themselves. In rotating farm crops, certain ones will not follow others advantageously, no matter how abundant the food supply may be. Our knowledge of these relationships is very vague and as the science of agriculture progresses, we must come to understand them better.

We do not know, for instance, to the satisfaction of all, what causes "sick" or "over-cropped" soils; or why it is that certain plants "exhaust" the soil for certain other plants; why fruit trees and some other crops do not thrive on newly cleared land following certain timbers, as the walnut and butternut; why rye grass, some of the *Erigerons* and some of the *Vetches*, as the tare, "poison" wheat. Thistles are said to "poison" oats; *Euphorbias* kill flax; members of the genus *Inula* are thought to be death to carrots; the peach and potato do not consort without mutual injury. We lay these antipathies to competition for food, moisture and air, but every observant cultivator knows that there are other factors causing such uncongenial relations of plants.

Nearly a century ago DeCandolle expounded his "excretory theory" to explain these incompatibilities. The "excretory theory" is now disproved of by botanists, but the above facts, which, in the main, gave rise to it, are still unexplained. Plants may not excrete poisons, but may they not in some way leave residues injurious to other plants? At any rate, we are not as yet able to wholly explain the facts which give rise to DeCandolle's theory.

Rotation of crops is a vital question in the agriculture of many countries. It is almost wholly a problem in the relationships of plants. The practice had its beginning in DeCandolle's theory that the residues left in the ground by plants were beneficial or detrimental to succeeding crops. The behavior of crops following clover was the chief fact upon which his "excretory theory" and the early systems of rotation were based. Until the discovery of the symbiosis of bacteria and the legumes, it was held that rotation was entirely a matter of soil and of food. Knowledge of the association maintained between bacteria and

members of the clover family has shed more light on the rotation of crops. May not other relationships be discovered which still further illuminate the now dogmatic practice of rotating crops?

Other relationships are those in which countless numbers of tiny plants, bacteria, exercise their role as helpers or destroyers of the plants we cultivate. We were once taught to think that all good bacteria were dead bacteria. But now we know that some of these wonder-working organisms are our best friends; that they not only aid in making good many of the products of the farm; but they make fertility; soil itself; in fact, are indispensable in the making of a farm. Each of the many kinds of bacteria has its special activities and of these we are especially interested in those which inhabit the tubercles on the roots of leguminous plants.

About these cluster a number of all-important relationships of the farm and orchard, as: the rotation of leguminous crops with others; the growing of clovers with grasses and grains; and the use of legumes as cover crops. Until recently our knowledge concerning these relationships was wholly empirical and we are yet far from understanding them well. When we remember that twenty years ago we did not even know of this partnership of bacteria and legumes—why, for example, clover fertilized soils, and that every year our knowledge of these relationships greatly increases, we can appreciate the possible value of future discoveries.

This somewhat lengthy introduction brings me, now, to my subject the relationships of catch crops and cover crops to orchard trees. Some observations and experiences of my own may be given here.

In 1897 the writer's attention was called to the behavior of peach trees in orchards where catch crops were always grown. The little town of Brigham City, Utah, is situated in a cove of the Wasatch Mountains. It has long been noted for its peaches. The soil is a decomposed rock, rich but very shallow, the loose rock, still decomposing, is within a foot of the surface. The peach land in the locality is limited in area, is under irrigation, and therefore valuable, so that the trees are always set closely and catch crops of vegetables and small fruits are grown between the rows. In this shallow soil the contact of roots between trees and crops of necessity is intimate. A better opportunity for

studying the relationship of various plants with the peach could hardly be found. The effects of the intermingling were most pronounced. One could almost tell from the color of the foliage or the amount of growth, or the maturity of fruit or leaf, what catch crop was being grown in the different peach orchards. Each of the families represented by the inter-crops seemed to have a distinct effect. Under irrigation, moisture had nothing to do with the differences. Competition for food must have been a factor, yet the peach requires but little food, the soil was rich, high tillage was given, and it seemed to me that the differences arose very largely from factors other than competition for food. Visits to the Brigham City orchards suggested experiments on the relationships of plants.

Opportunity did not offer to attempt these until two years ago, when a start was made on the grounds of the Michigan Agricultural College. Field experiments with various crops were tried in a young apple orchard; but little came of them. The soil was deep giving a root run for all plants; moisture conditions could not be controlled; the temperature was far less uniform than in Utah; and the apple seemed less sensitive to the companionship of other plants than the peach. Two years ago at the Michigan Agricultural College pot experiments with the peach and with various catch crops were begun. The first season's results are of interest.

Very briefly, we grew in large pots a number of plants representing several widely different families in intimate contact with peach trees. The experiment demonstrated pretty conclusively that the peach likes the company of some plants and just as heartily dislikes that of others. The fact came out again that the peach and the potato will not take their food together in peace. For myself, I feel pretty sure that if these two plants are in intimate contact the results will be disastrous and most so to the peach. Neither do I think the matter is wholly one of food and drink but think that the trouble is much more deep-seated, that in some way the one is poisonous to the other. Much ill-feeling seemed to be manifested between the grains, wheat and rye, and the peach; the disagreement was not so marked when members of the cabbage family and the peach came together, while the members of the pea and clover family were beneficial companions to the peach.

It is not supposed that other plants can make use of the nitrogen prepared for the roots on living legumes by bacteria, but the behavior of the peach and the clover in the pots in this experiment indicates that such may be the case. The larger growth when growing with clover than when growing alone seems to indicate that the peach roots absorb some of the food prepared by the tiny partners of the clover, or, that the clovers give up some of their prepared food to the peach.

The practical import of the above experiment is that at least the peach among our fruits wants her food and drink alone for most part. We except, of course, the clovers from the non-desirable plant companions of the peach. I believe that a similar state of affairs would be found to exist between other orchard trees and the various families of cultivated plants. This means that catch crops are not overly desirable for an orchard if the roots are to come in contact with those of the orchard trees.

The above experiment has an important bearing on the much mooted question of cover crops. Cover crops in an orchard serve three purposes. They protect the soil, enrich and hasten the seasonal maturity of the trees. We are usually advised to grow a crop which serves the three uses, but there may be objections to the triple purpose cover crop. Thus, one of the most apparent relations between the peach and the plants grown with it is that some of the herbaceous species check the growth of the trees, causing them to ripen their wood, and some do not; but, to the contrary, extend the growing season of the young trees. We found that long before there was sufficient frost to injure peach foliage, the seedling peaches grown in pots with oats, rye, blue grass, mustard, potatoes, or any one of the several other species, had dropped their leaves, and the trees were ready for winter. Not so with the young trees grown in pots with crimson clover, peas and beans. Until a severe frost on the night of November 1st, the leaves remained on these trees green and luxuriant. So far as ripening of wood is concerned, they are totally unprepared for winter.

An examination of the root growth in the various pots was interesting. The root systems of the trees and the plants in the first-named group were not at all intimate. The roots of the plants scarcely came in contact with each other, but the roots of the clover and the peach were so intermingled that they were matted together and could not be easily separated. The practical side of all this is that legumes are not good cover crops when

the object is to cause trees to ripen their wood. I believe that peach trees would suffer more in a cold winter with a legume as a cover crop than without a catch crop of any kind. The experience of Michigan peach growers confirms this opinion. For a cover crop to hasten the maturity of the tree, instead of a legume, one of the cereals, as oats or rye, would certainly answer the purpose much better.

In conclusion I must express the fear that I have given you little that is tangible in regard to cover and catch crops. My apology is that the practical side of the question has advanced as far as it can until more scientific work is done and that all that is practical is common knowledge, or should be, with every up-to-date fruit grower. That I have not given you more regarding the scientific side of the problem; my excuse must be that the field here is vast and vague. But surely we are not to leave it unexplored just because it is vast and vague. The little incursions we have made into the region but faintly indicates what lies therein. We have not touched the boundaries, if, indeed, there be boundaries. Much of what can now be seen is meaningless for we are not yet ready to ask intelligent questions. But the task of explorations need not appall us. That man has wrung from nature many of her secrets, impels us to become still more potent in our sway of her forces. But dominion in nature's realm is not given us. We must gain it by conquest. And so I leave the problems I have tried to lay before you—subjects for future conquests.

DISCUSSION.

Mr. Brackett: Would not your theory of the grass mulch on your peach trees which you stated would induce ripening before frost and hardening of the wood, would not that same theory work on the apple tree in a northern climate where young trees are liable to have late growth?

Prof. Hedrick: Certainly it would, but it would somewhat weaken the vitality of the trees, but if it were absolutely necessary to ripen the wood, to secure a good growth, it certainly would help. You would find that your trees would blossom and leaf out at least a week later in the late spring. I do not know of the advantages of the grass mulch myself, I do not claim

there are no advantages in the grass mulch, but it is true that trees mature their wood earlier with the grass mulch and also are later in coming into blossom.

Mr. Brackett: In our location west of Minneapolis nine tenths of the orchards planted there are grown with the grass mulch. I was employed two years ago to gather fruit for the St. Louis Exposition, and I visited every orchard in our country up there and I found that the orchards that were seeded down to grass, were the orchards that were bringing the money and they were successful and were not winter killing or blighting as early as the orchards that were thoroughly cultivated. I remember one case particularly of two orchards, one on each side of the road, standing right opposite each other on the same kind of ground, one orchard was thoroughly cultivated and blighted and killed to the ground, it was entirely worthless, while the other that had been seeded down to grass and had been for thirty-five years, the blight never touched it. Every year that orchard brings a good crop of apples. They have this year an off year with us on apples up there, but that one acre of ninety-four or ninety-five trees has brought in a revenue of \$240, while the other orchard, which is in thorough cultivation, has not brought in anything at all.

Mr. Underwood: How about plums?

Prof. Hedrick: We have the same effect as upon the peaches.

Mr. Underwood. And potatoes?

Prof. Hedrick: I am not sure about potatoes. From recent observations published by the United States Department of Agriculture I suspect the potato is not a tremendously desirable companion crop for any crop where the roots come in contact.

Mr. Burnham: I would like to ask the professor, as a compromise between the two, grass mulch and cultivation, how would it do to cultivate, say until July, as long as you wish, and then sow winter rye?

Prof. Hedrick: The thing to do. It is a good cover crop. I think the large orchardists in commercial orchards all over the country very largely practice that, unless there are conditions which make cultivation almost impossible, and there are those conditions, and there are the conditions in the northern climates, as the gentleman has just said, where you want the trees to mature their wood rapidly, and certainly there are cases where the grass mulch may be all right.

Mr. Foley: Would you recommend growing corn in a young orchard?

Prof. Hedrick: I think corn is the most desirable crop of any to be grown in young orchards. Corn and peas; beans also are desirable.

Mr. Kellogg: In cereals, is winter rye as desirable a crop where the party wishes to cultivate next year, as one of the cereals that would be killed by the winter, say oats or barley?

Prof. Hedrick: Well, if you begin your cultivation by plowing under, it makes little difference. If you are not going to plow, but simply cultivate, then the oats or barley would be the better cover crop than winter rye.

Mr. Kellogg: Would buckwheat be all right?

Prof. Hedrick: No, I do not like buckwheat for a cover crop. It is apt to give you a sour soil, so that I would not advise buckwheat at all. Wheat makes a fairly desirable cover crop. The practice in western New York and the practice for a greater part of southern Michigan, I think with apples at any rate and some other crops, is to use a clover like plant once in about two or three years and then use oats or rye or grain crop for two or three years, but all that depends on the amount of nitrogen in the soil.

Mr. Kellogg: Do you have any trouble with mice?

Prof. Hedrick: Yes, all over the country. I expect that every young tree that is set out in New York is protected through the winter against mice.

Mr. Kellogg: What protection are you using against mice?

Prof. Hedrick: A protector that is made in Syracuse, New York; I have forgotten the name of the article, but it is simply a cylinder of wire, small mesh wire, about 15 inches wide, similar to the wire mesh in a window screen, that is put about the trees. It costs about one or two cents for each tree, probably less, and universally throughout New York this wire mesh is used to protect the trees. We formerly used wood veneer and coarse paper and various other articles, but I believe this wire mesh is now used universally.

Mr. Kellogg: What objections are there to the veneer and paper?

Prof. Hedrick: Well, they decay quickly and mice sometimes get in, and another reason, they make the wood of the tree more tender than the wire mesh. That wire mesh lets in sun and

wind and is better for the tree. There is no great objection to the wood veneer, it is cheaper, but the wire mesh is much better.

Mr. Menn: What is the price?

Prof. Hedrick: I think \$10 or \$12 a thousand.

Mr. Bingham: I have used the wood protector and found I had much more trouble with the mice than without.

Prof. Hedrick: You will find the wire mesh, if you get it at a reasonable price, the best protection. It is put an inch or two into the ground.

A Member: What would be the harm in leaving the wire mesh in during the summer?

Prof. Hedrick: No harm except in cultivating you are continually catching onto the wire mesh, and it is a small matter to pick these up in the spring and put them on in the fall.

Mr. Brackett: I would like to know if in a cold climate it is not advisable to have trees root deep, that is, anything that will induce them to root deep is a good thing?

Prof. Hedrick: Tip-top; in any climate it is.

Mr. Brackett: Don't you think grass grown around trees, taking the moisture from the top of the ground, and also occupying the top of the ground as a surface, would induce deep rooting?

Prof. Hedrick: No, I think just the other way; I think it induces the roots to come to the surface. Without going into the philosophy as to why they do it, experience in plowing up grass orchards will show you the roots of the apple trees are right close up to the surface. In plowing each spring, you will find they are further down. Grass mulch brings them up to the surface. That is a fact any man can demonstrate.

Mr. Street: Is it best to plow every spring from the time the orchard is set, to keep that up, or to cultivate after the trees get two or three years old to practice cultivation without the plowing?

Prof. Hedrick: Well, I suspect there are many conditions in which you might omit the plowing now and then, but I should certainly recommend an occasional plowing up in the spring. In Michigan Horticultural College in which an old orchard was proved to be fairly profitable, we plowed every other year and cultivated every year and sowed a cover crop.

Mr. Kellogg: Would you recommend a well rotted manure in place of a cover crop?

Prof. Hedrick: It will take its place, but it is more expensive.

Mr. Kellogg: Will the added fertility pay for the extra expenditure?

Prof. Hedrick: I doubt it. I think the cost of hauling out the manure would be too great. If you have abundant manure it is a good thing for the orchard; it depends very largely on the soil.

A Member: What is the result say of ten year's cultivation in an orchard, no cover crop and plowing for that length of time.

Prof. Hedrick: I should not like to try it. By that time you have worked all your plant humus out of the soil, and it is like ashes, it is light and in a poor condition. No, I would prefer grass mulch to that.

The Member: I know some orchardists that have been practicing the cultivation and perhaps allowing little weeds to grow up in the orchard in the fall and again next spring cultivate again, with no cover crop.

Prof. Hedrick: I am sure I would not like it. No, tillage and cover crop must always be coupled together; cannot get results without them.

Mr. Moyle: Is there any experiment on record where there have been kept two orchards, one in cultivation and another in pasture for sheep, say for ten years; has any such experiment ever been conducted for a term of ten years?

Prof. Hedrick: No, I know of no experiment that has been laid out with that express purpose in view. I know of orchards nearly side by side, under the same conditions, that have been managed under such conditions for a greater length of time than that. Most of you know J. C. Woodward and G. P. Wilson, Mr. Van Alstine of New York and men who advocate pasturing orchards with sheep, although the orchards they have are very old orchards. All the men, however, claim that if they were setting out new orchards, they should not use the sheep pasture, but for the old orchard with the old trees they find it more profitable to pasture with the sheep than to plow and cultivate.

Mr. Moyle: I am glad to know that. I made the statement to the society and they laughed at me. I suggested that we pasture our orchards with sheep, and they said down in Missouri where they turned in the sheep they would not need to spray, and a gentleman from Missouri said it was a failure all the time.

Prof. Hedrick: I am not advocating that practice at all.

A Member: We have run sheep in the orchards and killed the worms.

Prof. Hedrick: There must be some other conditions there. The orchards that I have known that have sheep in pasture need just as much spraying as any other. I do not take much stock in sheep as a means of keeping down pests.

Mr. Moyle: Don't you think it would be a good idea to make a test for ten years, to decide that?

Prof. Hedrick: The trouble is that it would not be of benefit to a great many people in commercial orcharding, because sheep growing and fruit growing do not go hand in hand, and it might be of decided benefit to some few gentleman farmers and gentleman apple growers, but for orchardists it would not have any great value. A man could make his orchard much more of a success by giving it good orchard treatment, and I do not advocate the sheep treatment as good treatment. It is successful under some conditions, but under most conditions we do not advocate it.

Mr. Goodman: Our orchardists in Missouri adopt rather a medium plan. We have a rotation in our orchards, so that we continue the cultivation or the grass land or the weed land and thus take care of two or three times as much orchard land with the same number of teams than we could if we simply used any one plant, and that rotation is followed thus: A plowing of the ground during the fall and the winter of part of the land, then we let it go during the summer with only one cultivation or harrowing, and allow the weeds to take that ground and we find the weeds as a cover crop almost equal to cow peas, which is our best cover crop. We then follow that over portions of the land which have been plowed, sow it to cow peas in June and let that remain as a cover crop during the summer and winter, sometimes pasture that ground with hogs, sometimes cut it off for feed, sometimes let it be on the ground. Then the next spring that ground which was sowed to cow peas we seed to clover. So we have the four processes going on all the time, and every fourth year this sod ground is turned over and we follow the rotation so that we do not allow the land to keep in sod any more than the four years. I am sure that up north here you need a winter cover crop, I am sure you need, as we do down south there, a summer cover crop also, and I think that one-half of the winter killing was caused, I know in our Michi-

gan orchards, by not having a summer cover crop as well as a winter cover crop, and the best summer crop you can have is to let the weeds grow, if you cannot do anything else, and we utilize the weeds as part of our rotation system, as worth as much to us as the clover, not as much as cow peas, but as much as clover. That is a part of our rotation. I think here in the north you need a later summer cover crop in August and September as much as you do a winter cover crop. We do, down with us, and a cover crop for the winter we do not care for specially there as you do here. We are plowing all winter long in the orchard and that winter plowing we use next spring by either planting corn, sowing cow peas or harrowing it down during June and letting it go to weeds or seeding it to clover. I am positive in our orchard problem it is just as necessary to have a rotation in our orchard ground of the crops that grow there as it is for any farmer to follow rotation. I am sure that we can keep up the fertility of our ground in that way. We had some ground in which we planted trees that we cannot grow corn on at all, and that ground, by the turning over of weeds and cow peas is loose and nice and has really good fertility today, so that we have grown our crop of fruit on it this year.

Mr. Reeves: In the neighborhood where I live there are a number of orchards of Baldwins and Rhode Island Greenings and all those old eastern sorts. They were successful orchards, they paid as well as any later orchards that I know of. Now, the owners of those orchards had a system of caring for their orchards; they plowed in the spring, then cultivated a few times during the summer and then from July on let the weeds grow. They laid that down as an established principle. Now, I wonder if we are not going backwards rather than gaining knowledge all these years. That was some forty years ago and those men who grew those orchards were successful. They have varieties that we do not attempt to plant in that same neighborhood now. They kept the ground enriched, I will say that, and that will take the place of rotation.

Mr. Moyle: It seems to me it would be a valuable experiment to be carried on for ten years, taking ten acres of orchard land, five acres to be pastured with sheep, the other five to be under cultivation. Spray the trees and pick the fruit in both orchards, sell it and take the money you get from the sheep for wool and at the end of ten years I am sure the five-acre orchard in which you had the sheep will pay the largest amount of money.

I hope some of the experiment stations will try that experiment for ten years.

Mr. Goodman: Any one plan followed for ten years successively is not the correct plan to follow in my opinion. I would use the sheep and we do use sheep, but it is a part of the rotation in a plan which we follow. We use hogs and let them pasture down for one or two or three years, but to follow the same plan right straight through is just as wrong as it is to cultivate very thoroughly during the whole of the season, which is wrong.

Mr. Bingham: We start in the early spring and cultivate until about the time the fruit is ready to harvest. We suspend cultivation during the harvesting and then begin and cultivate once or twice more in the fall. Some of us have not been practicing having a cover crop any more than what amounted to weed growth from the time of cultivating to freezing up.

Mr. Goodman: Don't you get quite a little covering of weeds?

Mr. Bingham: We get a covering of weeds that covers the ground entirely.

Mr. Goodman: Well, that is right.

Mr. Rowe: We have one or two men, three men perhaps, in our county that have been able to grow apples that were just enough finer than the apples grown by any other person to get from two to three times as much per bushel as the other fellows were able to get and we have been observing their methods somewhat. One man, Mr. Charles Wilde, last year, when apples were cheap, was able to get at his own place seven miles out of the city from \$1.25 to \$2.00 a bushel from the best grocerymen; they came out and got them; he had a little over five thousand bushels. This year he is getting better than \$2.00. At our State Horticultural meeting he showed thirty varieties and there was not a single apple that could be found that had either a worm hole in it or a scab. At one of our institute meetings held right near his place he went into the storage and brought a box that was taken out at random and turned out on the table and you could find neither a scab nor a worm in his apples. Now, this man cultivates thoroughly, and he cultivates until after the 10th of September and his reason for doing that is that he wants to destroy by cultivation the homes of all the larvae that have gone into winter quarters to come up and sting his apples next year, and he cannot do it unless that is done. We know that

they all burrow within an inch of the surface of the ground and that they have all gone into winter quarters before the 10th of September, but if cultivation is stopped by the first of July, they are simply all housed there in nice quarters ready to hatch out in the spring and you have got your pest to fight again.

The President: Does he spray?

Mr. Rowe: He sprays thoroughly, but he says he never was successful with his spray unless he kept his cultivation up in that way.

Mr. Crawford: Has he had any winter killing?

Mr. Rowe: No, he has no winter killing at all. I might say this orchard is twenty-five years old and it was set to apples and peaches. The peaches are now gone, the last of the peaches were pulled out two years ago. Now it is an apple orchard, the trees were set sixteen feet apart and every other tree in the row was an apple tree and now the peaches are gone. He has kept up that cultivation for several years.

Mr. Henry: Do you think that method would answer here in Wisconsin just as well?

Mr. Rowe: I believe it would.

Mr. Street: How does he keep his fertility, the humus?

Mr. Rowe: The humus in the ground,—well, he puts on plenty of manure. He has quite a dairy in connection with his place and his stable manure is scattered out. About the 10th of September he sows oats, he gets quite a heavy stand of oats.

Mr. Goodman: He is doing the right thing exactly.

Mr. Rowe: But the main point I am trying to make is that it seems to me in all this talk of cultivation, you stop cultivating too quickly. The last three or four weeks it seems to me is the more important time to cultivate in order to help the spraying time out the next spring.

Mr. Toole: Are you troubled with winter killing under any conditions?

Mr. Rowe: Yes, we have some winter killing, but I think a great deal of what we call winter killing has not been winter killing. We have four men that have claimed that they were able by cultivation and treating of the soil to enable their trees without any cover crop to stand from eight to ten degrees more frost than they would otherwise and that by constant cultivation and no cover crop at all by the very liberal use of wood ashes. I know of one of our best exhibitors and the best growers for years, E. J. Philips, who was right close to the city and

he never had a cover crop and he grew the tenderest varieties of peaches and cherries by the liberal use of hardwood ashes. His teams were hauling ashes from the city all the time and he claimed his trees would stand from eight to ten degrees more frost, and I know, following that hard winter weather when no one in our section had any peaches the next year to speak of, because the buds were killed, Mr. Philips' were not any better looking than Mr. Grimes' or my own, but he had peaches to sell at \$3.00 a bushel and plenty of them, not as many as usual, but he had peaches. When cherries were all gone, Mr. Philips always had cherries. He contended, although it was disputed by many, but the old man always contended that he, by the liberal use of wood ashes, was able to make his trees that much hardier so that he did not need any cover crop. I don't know whether there has been any experiment carried on along that line.

Mr. Sperbeck: It seems to me that the late cultivation would stimulate a growth and be injurious in a northern latitude; that the wood would not mature in time to stand the winters.

Mr. Periam: That is a fallacy; the late cultivation does not necessarily throw the tree into late growth. Occasionally under any system the tree will stop growing and then take on a later growth, but the continuation of cultivation through the whole season does not necessarily, nor does it really, carry the tree into winter quarters with immature, unripe wood. That is the result of circumstances they get now and then.

Mr. Rowe: I have found in my own experience that when I had cultivated constantly until the 10th or 15th of September, that it did not cause trees to continue their growth longer than those that I stopped cultivating in July, but I found on the other hand that when I had a piece that was left and could not get out to plow it and did nothing with it until way along to the first of July, that there I would have a late growth. But when I began to cultivate early and kept it up late it did not continue the growth longer than if I had stopped. If I began late, that is where I had the trouble.

BORDEAUX MIXTURE AND HOW TO MAKE IT.

PROF. S. A. BEACH, Iowa State College.

I will talk to you a few moments upon the old subject of spraying with Bordeaux mixture. Bordeaux mixture has come to be recognized as par excellence the best liquid preparation with which to hold fungous diseases under control, speaking of those diseases that attack our fruit bearing plants. It is a mixture which was accidentally discovered; the hint was obtained from the practical experience of fruit growers in France; it is not something that was first worked out by scientists and then handed over to the fruit growers, but it is something which came from the fruit growers themselves. The story is of interest, it has been told a good many times, but I want to tell it again, as to just how this Bordeaux mixture came to be known.

The French grape growers some years ago found that an American disease was devastating their vineyards; it was the grape mildew, something that had been imported from this country, and was spreading there very rapidly, and causing a great deal of damage. In one of the districts near Bordeaux where grapes were grown, some of the grape growers were bothered by the pilfering of grapes from those vines that stood next to the road; people passing by would help themselves to the fruit and they determined to do something, if possible, to scare them. They did not wish to poison the fruit, but they did wish to make the people who went by believe that they had put something on that would poison them; so they took copper sulphate and mixed it with fresh slaked lime, and with a whisk of twigs spattered it over the grape vines along the road. It so happened that these men had the mildew on their grape vines and the important discovery was made that where this mixture of copper sulphate and lime had been spattered on the vines they did not have nearly so much of the mildew. This fact was reported to Millardet, professor of the faculty of sciences in Bordeaux. From this suggestion he and others worked up the method of making the preparation which we now know as Bordeaux mixture. In 1886, I think it was,

our United States department of agriculture first took the matter up and helped to introduce the use of this mixture in this country. We were then told to dissolve six pounds of the copper sulphate and slake four pounds of lime, mix the two together and dilute to twenty-five gallons; that made a mixture in which we had one pound of copper sulphate to make a little over four gallons of the Bordeaux mixture, a very strong mixture and it was also a different mixture to apply, as those of you can testify who had anything to do with making it. We would try to strain that mixture through sieves and gunnysacks and hold our temper and keep from saying our Sunday School lessons the wrong way while doing it, which sometimes was not an easy matter to do. But with years of experience in using this mixture, we have found some important improvements that are of interest to anybody who has anything to do with it. As you are fruit growers, I take it that the larger proportion of you have, or will have, something to do with this Bordeaux mixture, because it is one of the most efficient weapons that we can use against these fungous diseases which we must fight if we are to be permanently successful in fruit growing.

The first thing I will say about the preparation of the Bordeaux mixture is that instead of weighing out the definite amount of copper sulphate that you need each particular time you use the formula, it is possible to dissolve the copper sulphate beforehand, and know how much you have in solution and measure the number of pounds by the number of gallons you use.

First, with regard to the dissolving of it, if you would hang it in the top of the liquid the way I have hung this here, that is the best way to dissolve it, because as the water takes up the copper sulphate it becomes heavier and drops down to the bottom of the vessel; fresh water which is not charged with copper sulphate takes its place and the operation goes on until the water is saturated with the copper sulphate; whereas, if we drop the copper sulphate in the bottom of the water in the first place it takes a great deal longer to dissolve it. So in dissolving the copper sulphate, hang the copper sulphate in a sack in the top of the water. That is a little point, but it is a good thing to know.

By keeping more of the copper sulphate crystals in the vessel than the water can dissolve we may be sure that we have a

saturated solution; that is to say, the water has taken up all the copper sulphate it can hold. In that case at the ordinary temperatures at which we use water, we have about fifty ounces of copper sulphate in every gallon, practically three pounds to the gallon. So you can if you choose dissolve the copper sulphate now in February that you are going to use next summer. So long as you have a saturated solution, more than the water will take up, you know that every time you dip out a gallon measure of it, you have dipped out practically three pounds and it is not necessary for you to weigh it.

What is the Bordeaux mixture? It is simply a compound made from dissolved copper sulphate and fresh slaked lime. Why do we use the lime with it? The fungicidal properties are in the copper sulphate, not in the lime; it is because of the copper in the mixture that it is injurious to the fungus, not because of the lime in it. Why then do we use the lime? We use the lime to prevent the copper from injuring the foliage. In all this work of using insecticides and fungicides, the difficulty is to find something that will prevent the fungus from growing or that will kill the insect without at the same time injuring the foliage that we are working on. It is easy enough to find plenty of things that will kill the insects and kill the fungi, but the difficulty is to find something that will do that without injuring the foliage. Bordeaux mixture does not always do that. Sometimes we get some injury to the foliage by the use of Bordeaux mixture. But the copper sulphate solution is decidedly more injurious to foliage, so we use lime to combine with the copper sulphate and make a mixture that will not injure the foliage. The least amount of lime which it is safe to use is about two-thirds as much by weight of the stone lime as you have of the copper sulphate. That is a safe proportion; it will supply more than enough lime to combine with the copper sulphate. Thus, the formula which calls for six pounds of copper sulphate, and four pounds of lime is safe because it provides more than enough lime to combine with the copper sulphate. But if we have dissolved the copper sulphate so we can measure the number of pounds of dissolved copper sulphate by the gallon measure.

Is there not also some way in which we may tell whether we have enough of the lime so that it will not be necessary

to weigh the lime each time? If so, it has an advantage because in slaking the lime for the Bordeaux mixture it is best not to use it at once, just the minute that it has slaked. If you do you will find more grit in it then than you will if you let it remain a little while to become more thoroughly slaked. When masons slake lime for making plaster they prefer to let it remain a while after slaking before they use it. In making Bordeaux mixture it is also best to let it remain an hour or two in slaking so that all through it the fine particles will become slaked.

If we do slake the lime beforehand how can we tell when we have enough lime to combine with the copper sulphate? By a very simple test. I have here a poisonous substance, a yellow crystal, which is called prussiate of potash; the chemists call it by the name of potassium ferrocyanide. Five cents worth of it should be enough to last a man through the spraying season. Dissolve and it is ready to use. A little of it put in the mixture will find any of the free copper sulphate. In using this, all that is necessary is to drop a drop of it into the Bordeaux mixture which you have made, and it will show a dark color when there is not enough lime, but if there is lime enough it does not change color (demonstrating). You see here the dark color; it shows that some of the copper sulphate is free in such a manner that it will injure the foliage; and therefore more lime is needed. By using this test we are enabled to dissolve the copper sulphate beforehand; we are also enabled to slake the lime beforehand; we can, if we choose, slake enough to last for a week at a time because at any time we can tell by this test whether we have enough lime in the Bordeaux mixture.

Now, one point more. As an extra precaution to prevent possible injury to the foliage, it is well to have an excess of lime, particularly if you are using with it, as we usually do now, Paris green or some other arsenical poison against the insects. So after you have tested the Bordeaux mixture and find that you have enough lime, being sure, of course, that it is stirred thoroughly before making the test, then add some more lime, so that you will be doubly sure that there will be no injury to the foliage on that account.

Mr. Goodman: Would it be safe if we always use 4-4 instead of 6-4 formula.

Prof. Beach: The 4-4 formula calls for an equal weight of copper sulphate and lime. It is a safe measure; in fact, it is a disadvantage to use greatly more than that, because if you use too much lime it tends to counteract the fungicidal action of the mixture and so it is not well to use lime in too great an excess. An equal weight of copper sulphate and of lime is a very good rule. By a little practice in following the plan which I have given you can tell just about how much extra lime you will need to add in order to make your formula correspond to the one having ingredients of equal weight such as the 4-4 formula.

A word with reference to the strength of the Bordeaux mixture. As it was first used it was altogether stronger than needful in combating fungous diseases. The strength of the Bordeaux mixture can be varied to suit conditions. If you are spraying for the potato blight, you need a stronger mixture than you do if you are spraying apples for apple scab or peaches for peach curl. In spraying the apple orchards, a Bordeaux mixture which contains four pounds to forty-five gallons, or even four pounds to fifty gallons, is strong enough for all ordinary conditions. But if you are spraying potatoes for the blight, I would advise you to use one pound of copper sulphate to make eight or even seven gallons of mixture. That is to say, you would use six pounds of copper sulphate in spraying potatoes for blight, whereas in the apple orchard you would use but four pounds for an ordinary fifty gallon barrel. The ordinary kerosene barrel will hold a little over fifty gallons usually and when conveniently full it will hold from forty-five to fifty gallons.

There is a very important point about the way in which the mixture is put together. I wish to call your attention in particular to that. The good housewife can take flour and water and perhaps a little salt, possibly a little bit of sugar and some yeast and she will handle it so as to make good bread where you and I would make a botch of it. We may use the same materials, but we do not manipulate them in the same way and we do not get the same results. There is just about as much difference as that between the right way and wrong way of making Bordeaux mixture. If you make Bordeaux mixture one way, it is a mixture which settles rapidly to the bottom of the barrel, and one which needs to be agitated all

the while in order to have it put on at all satisfactorily. For various other reasons it is not as desirable a mixture to use as the Bordeaux mixture is when it is made properly. Let me demonstrate that to you. (Demonstrates.) From this saturated solution I will take a small amount of the copper sulphate and put the same amount in each one of these glass cylinders. Now, the directions which we received when we first began to work with the Bordeaux mixture was to dissolve the copper sulphate, put that in a barrel, slake the lime and put that in the barrel and then dilute the whole mixture to twenty-five gallons and this was the way we did it. (Demonstrates.) Now, we will take the copper sulphate solution in the other glass cylinder and first, before putting in the lime, we will dilute it to about one-half of the amount required to fill the formula. We will also dilute the lime to about one-half of the amount required, and then having both of them so diluted, we will pour the two together. Now, that is the Bordeaux mixture made in the proper way. You can see the difference that it makes in the kind of mixture that is obtained, whether the ingredients come together dilute, or whether they come together in concentrated form. This one which was made in concentrated form has already settled down, while I have been talking. You can see how rapidly it has settled to the bottom. Whereas, this other which was made in dilute form can stand from a half hour to an hour without settling, but a very little.

Notice with regard to the use of the Paris green or other insecticides, which are combined with the Bordeaux mixture, that having made the Bordeaux mixture in this way by bringing together the two ingredients in dilute form, lastly, we add the Paris green. The reason for this is that the Bordeaux mixture is composed of a sticky compound which is in suspension all through the liquid. When the Paris green is put in last, that sticky substance will hold the Paris green in suspension all through the liquid. Paris green is very heavy. If you do not believe it, put some in a tumbler of water and see how quickly it settles down to the bottom of the tumbler. When spraying Paris green on potatoes or on fruit trees, it is more essential than many think to keep the mixture thoroughly stirred in order to insure its even distribution and to prevent injury to the foliage. The other day I had a letter

from a gentleman living in Iowa who has about a hundred and sixty acres of apple orchard which he sprayed last summer. He sent me some samples of the leaves and complained about the fact that in spite of spraying the leaves showed that they were injured. An examination showed where the spray mixture had collected along the lower side of the leaf and killed the tissues; in some cases along the lower edge, in other cases on the tips of the leaves it showed where the mixture had run down and evaporated. Being thus made of concentrated strength it burned the tissue. You will find a great deal more trouble of this kind where you do not keep the mixture thoroughly stirred all of the while that you are making the application of the arsenical poison. Too many people in spraying potatoes with Paris green burn the foliage without realizing the amount of injury that they do in that way. In using Paris green, put it in last, so that the Bordeaux mixture will help to hold it up in suspension.

It is not necessary, however, to use as heavy a substance as Paris green for poisoning the insects. You can use the arsenate of lead, which although more expensive, can be put upon more tender foliage, that is, foliage that is particularly susceptible to injury from arsenical spray like plum foliage, with greater safety than you can put on Paris green. It is sometimes called disparene or rather disparene is a trade name for it. But you can yourself prepare an arsenical which will be less expensive than the Paris green, and if you are using it in any considerable quantity, it will doubtless pay you to do so. Get ordinary white arsenic which when bought in quantity, can be purchased very cheaply. Boil it with common sal soda, the washing soda, in order to dissolve the arsenic. This has been done with the sample I have here. This is the white arsenic boiled with sal soda, till, as you see, the arsenic dissolved. This gives an arsenite of soda which can be used by putting it right into the Bordeaux mixture. Be sure that you have an excess of lime so that the arsenical will not burn the foliage. It can be used in place of the Paris green at the rate of one pound of white arsenic, where your formula calls for two pounds of the Paris green. That is to say, if your formula for spraying the apple orchard calls for one pound of the Paris green to 150 gallons, you can use instead a quantity of this arsenical solution equivalent to one-half pound of white

arsenic, because the white arsenic is twice as strong as the Paris green. It can be boiled as just directed and then put away and kept indefinitely. By knowing just how many pounds of white arsenic you have in a certain number of gallons of this liquid you can measure it out by the pint or by the quart and know exactly the equivalent amount of white arsenic which that pint or quart represents. In that way you can use it against all leaf-eating insects, such as the codling moth, tent caterpillar, the potato beetles and other insects which injure foliage by eating it. This, when used with Bordeaux mixture should also be put in after the Bordeaux mixture is made. Summarizing what I have said on this matter, notice:

We can dissolve the copper sulphate readily and keep it in solution, and approximately know the number of pounds we have in solution if we keep the solution saturated. You can of course dissolve, say, fifty pounds of the copper sulphate in twenty-five gallons and know that you have two pounds in every gallon, but if you leave that exposed to the air, gradually it will evaporate, and if you give it time it will evaporate until it contains about three pounds to every gallon, whereas, if you use a saturated solution in the first place it does not matter how much is evaporates because the solution can get no stronger.

We can slake the lime beforehand and know how much lime we have by using the ferrocyanide test to show how much is required to combine with the copper sulphate.

We can prepare the Bordeaux mixture so that it will make a heavy mixture that will settle quickly to the bottom if we choose to do so by combining the ingredients in concentrated form, or if we choose to follow a better plan and combine the ingredients in as dilute form as possible we can prepare a Bordeaux mixture which will hold up so that it needs less agitating.

We can greatly add to the uniformity of the distribution of the Paris green or other arsenical if we add it the last thing after the Bordeaux mixture is made.

DISCUSSION.

Mr. Bingham: The gentleman said that in making the saturated solution it did not matter any time after that how long it was kept, at any time you could tell how much blue vitriol there was in it.

Prof. Beach: Yes.

Mr. Bingham: If you make a saturated solution and leave it stand two or three weeks and it evaporates, what becomes of that extra amount of the blue vitriol?

Prof. Beach: It will crystalize on the outside of the barrel. I have specimens of the other arsenicals that are used. This one is Swift's arsenate of lead, which is a form that can be used on plum foliage with less liability of taking off the leaves than if you used Paris green.

Mr. Rowe: Did you not give us the formula for making this?

Prof. Beach: I will not attempt to give you the formulas for two reasons: First, if I give to you, you will not remember them, and you can get them better by sending to your stations and find them in the bulletins printed there.

Mr. Rowe: The reason I asked the question, I used that altogether last year. I made it myself, and the cost, as I remember now, was about seventy-five cents for 250 gallons.

Prof. Beach: I would advise any one to get that formula from the experiment stations. Here is another form of the same general compound which is called disparene. That is a proprietary article, but it is practically arsenate of lead and used for the same purpose.

Mr. Goodman: Is it perfectly safe to use disparene in the Bordeaux mixture?

Prof. Beach: I have found it so. I have not had any contrary experience.

Mr. Goodman: I never had, but some men reported that it was dangerous to use it, that is, it was no good.

Prof. Beach: Well, let me state this, by using the disparene you need to use probably three pounds of disparene where you use one pound of Paris green and they may not have used it strong enough. It is a more expensive, although a safer thing to use than Paris green.

Mr. Johnson: I would like to ask if you prepare the Paris green in any way? How do you apply the Paris green when you put it in?

Prof. Beach: Well, we take Paris green in this ordinary form, weigh it out, if we are to use four ounces to the barrel, weigh it out in a little sack and then when we get ready to put it into the Bordeaux mixture, instead of doing as you have seen some men do, take the sack and dust it out on the top of the barrel and have it roll off in little balls on top of the water, we go again to the good housewife for some good sense and do the same way that she would do if she were putting flour into gravy, that is to say, wet it with a little water, then it will go all through the mixture in uniform proportion.

Mr. Smith: I would like to ask what proportions of arsenic and soda is used, in combining to make this solution that you spoke of?

Prof. Beach: Yes, I did not give you that. I will break over my rule that I stated and I will give you that. In making the arsenite of soda for one pound of white arsenic you need four pounds of sal soda.

Mr. Smith: How long do you have to boil it?

Prof. Beach: Well, usually it will be made in 15 minutes' boiling, to put it all in solution.

Mr. Smith: How much water?

Prof. Beach: Oh, well, you will find that a pound of the arsenic and four pounds of the sal soda and two gallons of water will give you a very good formula to use. Then you know that in every gallon of water you have what is equivalent to one pound of Paris green. And, let me say, that if you put in a certain measure of water in boiling, and that is partly evaporated during the process of boiling, and when you get through boiling put in some more water to make up for what was lost in boiling, so that you will have the same measure when you get through as you had when starting.

Mr. Rowe: If I did not misunderstand you, you said you put three pounds of copper sulphate, dissolved it in one gallon of water?

Prof. Beach: Yes. I said you can do that for your use.

Mr. Rowe: We have never been able to get more than one pound in a gallon of water and hold it there long.

Prof. Beach: Well, Michigan water must be different from



An old-fashioned, high-headed tree. All the energies of the tree are consumed in maintaining the large wood area. The fruit is borne at the extreme ends of branches. Tree difficult to spray, prune and harvest fruit. Illustration after S. T. Maynard.



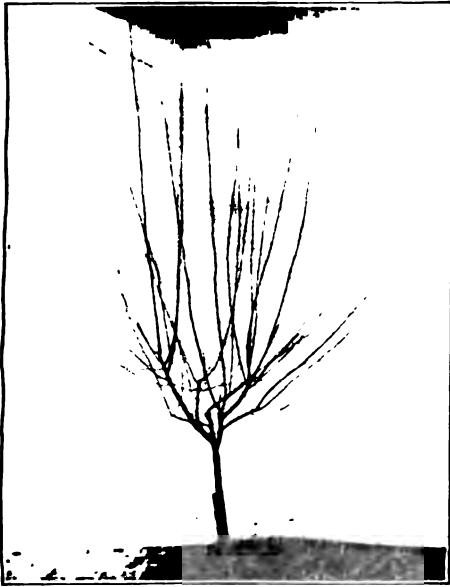
An ideal apple tree—low headed, symmetrical and open centered. Note the absence of central leader.



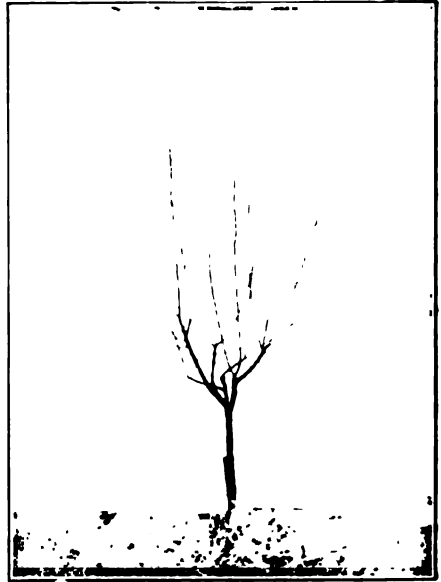
A native plum tree before being pruned.



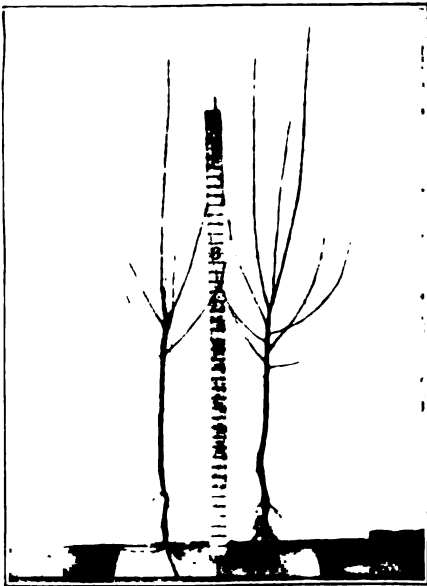
Tree after pruning. The branches cut back only a little to prevent excessive wood growth.



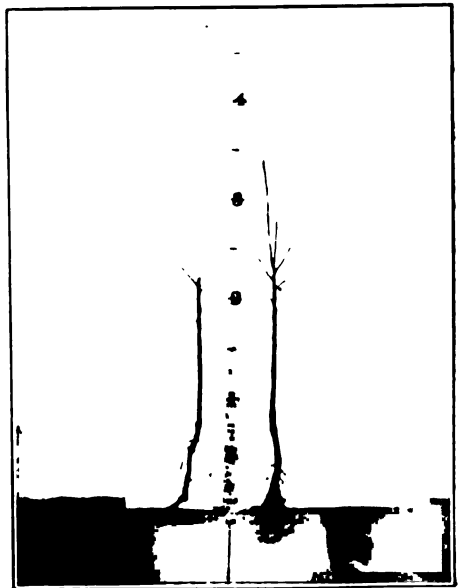
A well grown native plum tree before pruning.



Note thinning out the center and shortening the branches to prevent breaking when loaded with fruit.



Two ideal nursery trees (two years old).



Two ideal nursery trees pruned ready for planting. Tree to the right is pruned for a leader. Tree to the left for an open center without leader.

New York water then. We get three pounds in there; I think you ought to be able to crowd in more than one up in Michigan.

A Member: I would like to ask how much arsenite of soda you use?

Prof. Beach: I would use it on the basis of how many pounds of white arsenic you have in your solution. If you make a solution according to the formula that I just gave, in which you have one pound of white arsenic in two gallons, then you see you have a half pound of white arsenic in every gallon, haven't you. Now, that is equal to one pound of Paris green, and use it in the same way that you would use Paris green. Is that clear?

A Member: Don't you put more lime in your Bordeaux when you use the arsenite?

Prof. Beach: Well, if you have even 4-4 lime, then you have enough lime to take care of the arsenic in the arsenite of soda. If you are using the arsenite of soda on your peaches without Bordeaux mixture, then it would be necessary for you to put in, I should say two pounds of lime for every pound of the white arsenic, so that you would be sure that you will not burn the foliage.

A Member: Does soft water dissolve copper sulphate as hard water?

Prof. Beach: Either will dissolve it.

Mr. Goodman: The question is, will it dissolve it more readily?

Prof. Beach: Soft water would dissolve it a little more readily; not enough to make any difference in practical work.

PRUNING.

PROF. E. P. SANDSTEN.

The subject of pruning is one on which there is abundant room for opinions and disagreements. Hardly two fruit growers will agree exactly as to the manner a given class of fruit trees should be pruned. Individual opinions are prerequisites to suc-

cessful fruit growing and nowhere can individualism show itself to greater advantage than in pruning, hence the question of form or shape to be given a fruit tree depends upon the conception of the individual. This being the case, this paper is written from the personal point of view, rather than from generalization of other people's ideas.

Apart from individual ideas of pruning a few principles can be laid down which may be safely followed by beginners and amateurs. First, it is well to consider that in dealing with a tree we are dealing with a complex organism, not an individual but a collection of individuals or a colony. Between the different buds or individuals in this colony there is a constant struggle for existence, resulting in great mortality between the warring buds and branches. Those occupying the favorite positions with respect to light, moisture and food supply, naturally survive and grow stronger, while the others gradually starve to death. This struggle is nature's way of pruning and we should not look upon our pruning as a devitalizing and injurious process, but rather as a means to regulate the struggle by cutting out the weak and undesirable branches and shoots and selecting those which will form the most advantageous shape of a tree. So instead of permitting the struggle for existence to settle the supremacy between the different branches and shoots, the wise fruit grower stops the battle and directs the future development of the tree to best serve his purpose.

We may consider the subject of pruning under three separate heads. First: Pruning to maintain a balance between the production of wood and the production of fruit. Second: Pruning to shape the trees to facilitate the various orchard operations, such as pruning, thinning, spraying, etc., Third: Pruning to shape the tree to conform to the owner's ideal of form.

Pruning to maintain a balance between fruit production and wood growth.—Pruning so as to maintain a balance between these two functions is of vital importance to the fruit grower because upon such balance success or failure depend. In nature the trees come into close contact with other trees and a struggle for existence between them results, the stronger ones crowding out the weaker. In cultivation this struggle for existence between trees is eliminated and they are given an opportunity to develop without much competition. It is obvious that under such conditions the natural tendencies and functions of the tree are

often thrown out of harmony. If the soil is very fertile, or especially rich in nitrogen, the wood producing functions tend to crowd out the fruit producing functions, or if the soil is poor, fruit production is encouraged at the expense of wood production and the vitality is affected, which may result in premature death. Often under conditions such as these, intelligent pruning may correct the difference.

Pruning for wood.—(Winter and early spring pruning.) The best time to do general pruning is from the 15th of February to the first of April. Wounds made at this time will heal very readily and there is little devitalizing effect on the trees. It should be remembered that pruning at this time acts as a stimulant and tends to encourage greater wood growth. Hence winter and spring pruning should be practiced on young trees during their formative period and on old, run down trees, which have become weakened and unproductive from the lack of young wood. All heavy pruning should be done at this time, as there is less danger of the wound becoming diseased, and besides the healing process is most rapid in the early spring.

Pruning for fruit.—(Summer pruning.) As a rule heavy wood growth is not conducive to fruitfulness, while slow wood growth encourages fruit production. Light summer pruning is employed to check the wood growth and induce the formation of fruit buds. In order that summer pruning may be effective, it should be done from the 15th of June to the 15th of July in our climate. The young shoots will have grown to the length of 8 to 12 inches and should be pinched back two to four inches. Now and then a leading shoot should be left to grow. The buds below the pinched portion will, as a rule, begin to swell and develop into fruit buds. Should the secondary leaf buds start after pinching back, the operation should be repeated. No heavy pruning of apples, pears, cherries and plum trees should be done during the summer. The result will generally prove serious, since by the removal of the leaves the tree is unable to elaborate food to supply the root system and the development of new shoots.

On the other hand the root system continues to supply more water and mineral matter than the leaves can make use of and bad results follow. To be on the safe side, we should confine the summer pruning to the pinching-back process and the rubbing off of water sprouts.

Pruning to facilitate spraying, thinning, harvesting, etc. The most successful grower is one who can produce the best possible crop at the lowest possible cost. Low headed trees will naturally lessen the cost of spraying, since the trees are closer to the ground and can be reached and covered readily. Thinning and harvesting can be done more cheaply from low headed trees than from high headed. Those of us who have picked apples from the old style trees with branch and trunk resembling our elms and oak can appreciate the advantage of low headed trees.

The old style trees are not economical. They carry too much unproductive wood, which consumes food otherwise used for the production of fruit. The modern fruit grower wants a business tree—one that devotes the larger part of its energies to producing fruit, and at the same time permits of easy pruning, spraying thinning and harvesting. These operations necessarily play an important part in the economical production of the fruit. Low headed trees will not break down as easily as a high headed one, and the fruit will not blow off as quickly. Sun scald, one of the besetting evils of northwestern fruit growing, is practically eliminated by low headed trees.

I have no arbitrary height at which fruit trees should be headed—any height below 24 inches. This may seem too low to most people—especially those who are in the habit of growing and pruning apple trees into forest trees. But bear in mind that we want an apple tree and not a forest tree, that we want fruit and plenty of it, and not fire wood. The nurserymen are willing (if not, they should be) to supply low headed trees if we demand them, but as long as we prefer fishing poles and whips, we will be served with them. It may cost more to grow low-headed, stocky trees, since a fewer number are given on a given area, and besides, it demands more labor, but the time is at hand when the fruit grower is willing to pay if he can get what he wants.

Pruning to shape the tree to conform to the owner's ideal.—This phase of pruning is the most difficult to discuss because the question is not based upon any well founded scientific principles. It matters little whether a grower prunes his trees to a pyramid shape or a vase shape, whether it is hollow centered or left in the natural shape, so long as the foregoing principles of pruning have been observed. Personally I prefer an open centered tree, with moderately spreading branches. Perhaps I prefer this

style of a tree because it is an ideal with me and one I should follow in planting an orchard—with you it may be another shape. The ideal, however, should never be allowed to interfere with the general principles of pruning, and the most economical way of caring for the trees.

Pruning after planting.—With these few remarks upon pruning in general, we may start with the young tree when ready to set in the orchard. Personally I prefer a strong two-year old tree, with head formed within 18 to 24 inches of the ground. If three-year old trees are used, I should want them headed back severely at the beginning of the second year so as to form a low-headed, compact tree.

If, however, we have to accept what we can purchase in the market, the first thing to do is to decide upon a shape or ideal the grower wishes to follow. If open or hollowed centered trees are wanted, the leading shoot should be cut out entirely and the strong secondary branches pruned back to about four to six inches, depending upon their size. From four to five strong secondary branches should be left and these should be located little above each other and be distributed around the trunk. If on the contrary we wish to maintain a leader, we should only cut back the leader from two-thirds to one-half of the past season's growth and the secondary shoots proportionately. It is seldom advisable to prune back to the old wood when planting, excepting peaches and apricots. These may be cut back very severely without danger. The foregoing remarks are especially applicable to apples and in a measure apply to the pruning of plums.

The pruning of the trees a second year after planting is an important operation and should be carefully done, if the best results are to be expected. The ideal that the fruit grower has in mind should be emphasized and the young trees shaped to conform to it. If the pruning has been done carefully the first year, it will be much less the second, consisting mostly in the removal of shoots which cross or interfere with other shoots, or shortening in some of the branches, which are growing unduly fast so as to give the weaker ones a chance to develop. The subsequent pruning of the trees should be along the same line as indicated. No severe pruning, as a rule, is necessary, for if the trees have once attained a proper form, and yearly judicious pruning done, there is little occasion for severe cutting.

After the trees come into good bearing, pruning on the same scale should be continued. Most fruit growers will find that if the trees have been properly pruned up to the time of bearing, that the two functions of wood growth and fruitfulness are well balanced and that the tree will generally take care of itself. Personally I have no sympathy with the fruit grower or farmer who prunes without any idea as to the needs of the tree. In fact, the pruning is with him nothing but a trimming process that is performed once in five or ten years. Such pruning or trimming is always injurious.

So far no mention has been made of the method of cutting and disinfection of the wound. As a rule small branches, one inch in diameter and smaller, need no further attention after cutting. Larger branches should be painted with thick lead paint to prevent the ingress of fungous diseases. The cut should be made as close as possible to the stem or the main trunk and be left smooth. A cut so made will heal quickly and decay will be prevented. If stubs are left, these invariably prevent the healing of the wound and form an excellent place for the spores of the fungi, and black heart and decay result. A great deal of decay and rotting in our orchards come from bad pruning.

Before closing, a few moments' thought should be given to the pruning of our native plums. Those of you who have had the privilege of dealing with these trees, know the difficulties which are encountered. It is impossible to predict the shape or the direction or growth of a native plum tree. If we endeavor to prune a branch with the idea of directing the terminal bud left, we are generally disappointed. It may take any direction. If, on the other hand, the branches are permitted to grow without cutting back, disastrous results are sure to follow. A young plum tree will grow as much as six or seven feet in a single season, making long, slender branches. The subsequent branching generally takes place near the end of the shoots, leaving long slender branches, which upon fruiting, are bound to break. Still, if we cut back the long shoots to within a foot or two of the old ones, a great number of secondary branches develop, which in turn must be removed the following year, which entails a considerable amount of labor. Still, I firmly believe that this is the most rational method of pruning the native plum. Long slender plum trees should be avoided, as they invariably split. The head should be formed of at least three branches,

four or five is better still, but these should be situated one above the other, on the trunk, and not concentrated at one point. I also believe that we are making a considerable mistake in pruning the plum. If we wish to prevent as much breakage as possible, we should permit the branches to spring up as close to the ground as possible, making it a compact bush, rather than a tree. From observation I have found that 75 per cent of the trees in plum orchards have invariably broken down or split from wind or over-loading with fruit. This in a measure can be prevented by extremely low heading of the trees. They may not be as convenient to cultivate, but this is a secondary matter, if we can prevent the trees from breaking.

In regard to cherries, little pruning is necessary. In fact, beyond the first or second year no pruning should be done. They naturally form a symmetrical and well-balanced head and the wood growth is, on the average, consistent with the production of fruit. There is great danger in severe pruning cherry trees, since the wounds do not heal readily and decay invariably sets in. The same is true in planting young cherry trees; they cannot be cut back as severely as apples or plums—relatively little pruning should be done.

I have often noticed in buying fruit trees from nurseries, that careless pruning has been done. Instead of cutting off a branch or twig in the nursery close to the trunk or main branches, stubs from one to three inches are left. These stubs prevent the healing of the wound and black heart and decay set in, resulting in the premature death of the trees.

DISCUSSION.

Mr. Taylor: You spoke about trimming trees in the summer to make them form fruit buds, I would like to ask you what time in the season?

Prof. Sandsten: The fruit buds begin to form the latter part of July up to the middle of August. Now the seasons vary, the time varies from year to year. It is a fact that in all the ordinary fruit trees, the fruit buds form the season before, generally in July.

Mr. Goodman: Would it not remedy your plum pruning to prune one-third of the branches down, or one-half, and leave

the other half to carry fruit on them? We have some large growing peach trees growing the same way. You cannot make all the cuts, you have to make too much of a cutting, vary the places of cutting down, cut one half this way, and then up half-way, and then a little off the top.

Prof. Sandsten: I did that to a certain extent, but we cannot tell—the worst part of our plum tree is, they go in all directions, they go horizontally. If they would take a general direction like the peach tree, we would be sure of their way, but they do not take that way. Some of them go down and go up again; they have very bad habits.

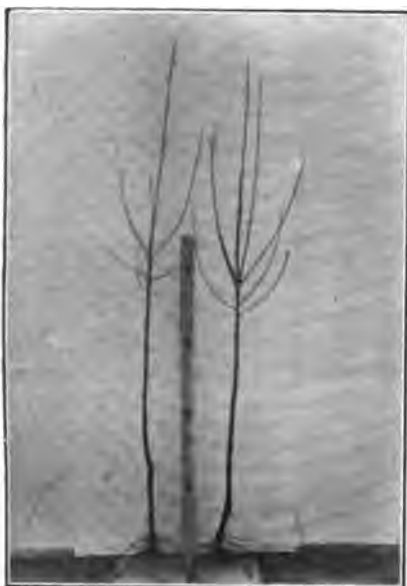
Mr. Crawford: How would it do to let those plum trees go altogether unpruned?

Prof. Sandsten: They would look like a brush pile. They would be all right if you keep them in the woods, if several of them come together, then they will stay up, but you cannot spray them or do anything with them when planted close together, and when not planted close together they will grow in all directions; you cannot do anything; they are not civilized at all. I would like to ask Mr. Marshall what his idea of pruning native plums is and what his experience is. He has a large native plum orchard and he has run up against some of the problems that we have.

Mr. Marshall: I am a great deal like you are, I find I know nothing about it, and the more I prune them the less I know. Mr. Rowe I think spoke about pinching them back in the summer, along in August about the time the terminal buds form, is that what you mean?

Mr. Rowe: No, sir, pinch them back when they get out just as much as you want of them, two or three feet. The Burbank will grow in the old way sometimes ten feet, but we have watched those young trees and when we have a length of limb as long as we want, we trim off the terminal bud, usually about June, just after the thing starts to grow. It starts in a hurry when it starts.

Mr. Marshall: I never have tried that. I have tried trimming the terminal buds off, and that was not at all successful, and I think that the native plum is much more difficult to prune than the Burbank. I have some Burbank trees, about 50 Burbank trees in my orchard; I never have had the difficulty with them that I have had with the native plum. Take such a plum as the Wyant, that insists upon growing upside down, and it is



Two well grown apple trees but too high-headed. Should have been cut back at the end of the second season. The kind of tree the average grower demands.



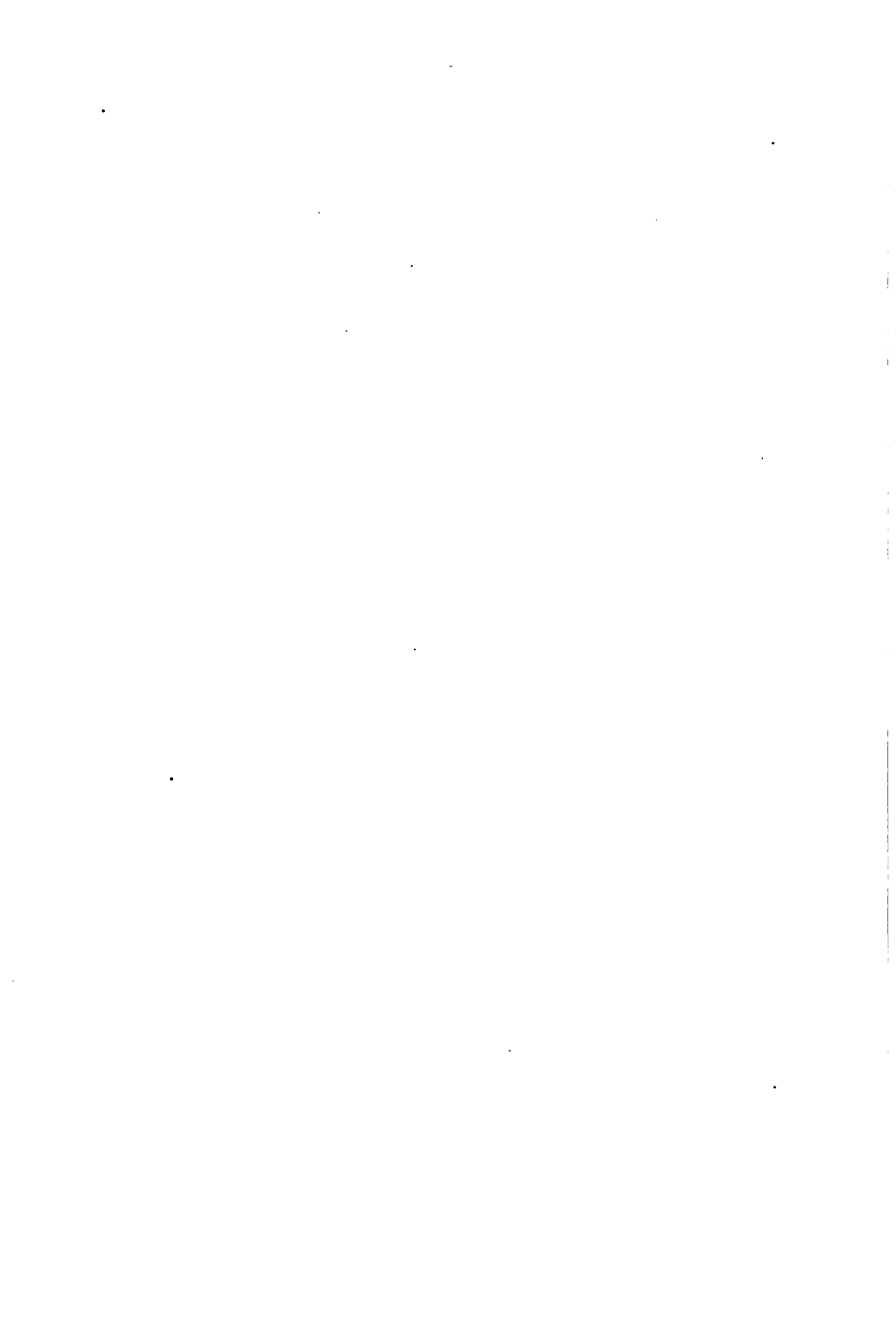
Trees pruned and ready for planting. Tree to the left pruned to a leader. Tree to the right pruned to a hollow center and spreading head.



Different styles of pruning shears. After Prof. L. B. Judson.



Different styles of pruning saws. After Prof. L. B. Judson.



pretty hard, I have never found any way to turn it around by pruning, and the other trees, all of the native plums, with the exception of a very few, like the Surprise and the Hammer, they are naturally quite shapely, and are very difficult to prune, for the reason that Prof. Sandsten spoke of. If you let your branch grow to the length that you think it ought to be pruned, why, then you have that extent of limb out from the trunk to wherever you prune it, without anything on it, and the fruit buds will form on the new growth, and of course it gives the weight so much more lever, and I have never discovered any way to stop it.

Mr. Rowe. Pinching them back you will find will do this with the plum just the same as it does with the black raspberry. If they come to a certain length, pinch out that when it comes out a foot or eighteen inches, wherever you want it, you will find it will throw out and fill right up back, if it is early in the season when your wood is young and tender and they fill out that branch back there with limbs.

Mr. Marshall: That may be practical in an orchard, but I have my doubts of it in an orchard of native plums. But at the suggestion of Mr. Hale I cut back at the time the terminal bud formed; he said that was practical, had been successful in his orchard in Georgia with the Burbank and the other Japan plums, and I have tried it on for two years now on 100 trees and I cannot see that it is any better than the winter pruning.

Prof. Beach: Did you find a difference in the habit of the different trees of the same variety?

Mr. Marshall: Some, not very much however. Take trees like the Wyant and Quaker and the Brittlewood, and you never can tell what they are going to do, or where they are going to jump, they will go almost any way. The Brittlewood I think is one of the worst of the native plums.

Prof. Beach: Would it not improve the variety of plum you wish to grow, suppose it was the Surprise, to take the buds from the most shapely tree?

Mr. Marshall: Well, the Surprise has most shapely trees.

Mr. Toole: I have a few plum trees, have been pruning at them for several years, young trees, and possibly I have not pruned them long enough to get scared about it, and the difficulty with these trees is making the rapid growth, and then, as has been mentioned before, if you do any pruning on these low

sprouts they will invariably string out at the tops; the consequence is, you have long, slender twigs on the tops of the trees and the trouble of breaking down will occur. I cut back not less than two-thirds of the growth. Some will say that I cut back too much; my experience is that if I cut back two-thirds I am not cutting enough rather than overdoing it, and you may feel as though you may have a very brushy tree in a very short time. If we have a few branches in there and they can easily be taken out while they are young, if the tree has a tendency of throwing twisted branches, as the Wyant does, such branches are easily taken away, and as soon as the tree gets to fruiting you do not have the excessive growth, and the tree that you thought was going to be so very full ceases to get out of shape.

Mr. Marshall: I do not want to have any misunderstanding. I do not say that the native plum tree cannot be made to grow the way and shape you want it to, but what I have been looking for for years is how to do that economically, so that it will be practical in a commercial orchard of 2,000 or 3,000 trees. If a man has a few trees he can devote time to them that he could not afford to devote where he is growing them to any extent at all.

Prof. Sandsten: That idea that I want to bring out is not pertaining to the bearing period, but to the formative period. It takes care of itself after it gets into bearing, the wood growth is not very heavy, and the tree takes care of itself.

Mr. Fales: The professor advises quite a low-headed tree. That is all right to a certain extent, I believe in a medium low head, but we do not advise as low as he does.

Mr. Rowe: We have found that the upright growing trees we can head very low, but the spreading trees of the Wolf River type and that class of trees we want to start high, because we can never keep the limbs off the ground, so it depends on the variety where we want to place the head.

Mr. Goodman: I want to say just a little right here, because we have had to train so many thousands of trees and have come to just this conclusion. In all apple orcharding the first year you have a spreading tree, the second year, if your tree is right, you have your branches cut out at right angles; you will find that in any good two-year old tree, if you shape those trees well, start out in the one year old, those branches will start out at right angles and you have plenty of those. Now, if you prune that tree, if you leave your center shoot straight down, cut those

branches aside and make them head 18 inches or two feet—we never head over two feet, rather 15 to 18 inches—and then next year you will have shoots from each of those side branches, and this main shoot, let it continue on and you will have branches come out at right angles there, and in three years you will get that head and that tree formed so that there will be no crotches at all, as long as you keep that center going up like an evergreen tree, just an example of what we keep in mind always for the first three years in growing that tree, with the center shoot always leading and the branches at right angles as much as possible. If a branch comes out like your two fingers, this way (indicating) we either take that off close to the tree, or we cut it back and leave a couple of inches, just two buds only, so as to make it come at the branch, and leave this one, two or three feet long and take this one off (indicating), just simply leave a couple of inches, and if you follow that for three years you will invariably get your trees without any crotches at all, because you have your center leader which will follow the same as it will in a spruce tree. Now, it does not make any difference whether that tree is Rhode Island Greening or Winesap, or an upgrowing tree like the Red June, it does not make any difference in after years, ten or fifteen years, if you find your tree is too low to the ground, you have got enough anyway to take off there; but just like the forest tree establishes its branches below because they will come off, they are little stem shoots; you can cut the lower branches off some Norway spruce trees with a very little care, and they are kept in that way so that in after years you can raise the head as you determine to do it. We in the south do not want to do that, but you in the north want to do that. But for the first three years, if you will have your ideal tree with the center shoot, and get your branches at right angles from that center shoot, and follow that plan every year, to see that your leader gets the advantage, keep all the others back for this leader, then you will have no forks in your trees. I do not mean by that that you will find all our trees that way, but you will find a great many of our trees that way, because we cannot follow all of them so closely as to keep that ideal, but we do follow that ideal tree for the first three years, and we scarcely ever have a fork, but if we do have a fork, we bore a hole and put an iron nut through and bolt it.

FAITH, HOPE AND CHERRIES.

A. L. HATCH, Sturgeon Bay, Wis.

'I have been actively engaged in horticultural pursuits in Wisconsin since the spring of 1869. In that time I have grown considerable quantities of about all kinds of fruit grown in the state. Of them all the cherry is my favorite. When we made our first plantings of fruit trees at Sturgeon Bay they included a liberal quantity of cherries. Prof. Goff and I had faith in the Door County Peninsula for certain kinds of fruits and our hope was that we might show how fruit growing there could be made profitable. In cherry culture at least, our faith and hope have been pretty fully realized as several years of success amply shows.

While our success is largely dependent upon the climatic conditions of the Sturgeon Bay region, its soil and environment, we wish to state that our efforts there have been confined exclusively to development and in no sense have they been of a speculative nature. Nor shall I exploit the region in any way but what I know it richly merits as a natural vantage ground for the upbuilding of a splendid industry of which every good citizen may well feel proud.

One reason why the cherry has proven so good for us is because it is not so exacting of particular care at all times as most fruits are. Relieved of its fruit burden in midsummer it has the balance of the season to recover from the effects of the crop it has borne. Although I have had trees bear heavily, with a single exception, I have seen none that have suffered from overbearing. This is more than I can say of plums or apples many of which are quite ruined by the loads of fruit they are allowed to bear some seasons. While it is often necessary to thin the fruit of the apple and plum I have not found it necessary with the cherry.

The harvest of the fruit early in the season eliminates about one half the risks of injury from winds, hail etc., that trees carrying their fruit the whole season must assume. This early harvest is also a decided market advantage, as the fruit does not compete with the usual flood of fall fruits and therefore sells at far better prices.

Another and excellent feature is the early and continuous fruitfulness of the trees. As soon as the trees become established in the orchard and have made sufficient growth of branches they begin to bear and keep it up year after year if well cared for. Two or three sprayings with Bordeaux mixture with a little arsenical poison added seems to control fungous diseases and insect troubles. Indeed, as far as insects are concerned we have had no cherries injured and that is more than we could ever say of plums or apples no matter how much we sprayed.

Still another reason why we like the cherry is because it is easy to get the fruit picked. The children and women we employ seem to like the work and as they make good wages at it the harvest is more like a jolly picnic than hard work as far as the picking goes.

Of the advantages for cherry growing possessed by the Sturgeon Bay region one of the most marked is the effect of the mild temperature of the growing season. The excessive heat both night and day experienced in the interior of the state away from the influence of the water is scarcely known at Sturgeon Bay and as a result our fruit is firmer, less likely to decay, and ships better. About the close of the cherry season Prof. Sandsten visited our place and expressed his surprise at the excellence of our cherries, declaring them superior to those he had seen elsewhere. We hope this will come to the notice of some enterprising young man who will come to Sturgeon Bay and establish a cannery for putting up our fruit in glass to the end of not only producing a strictly high grade and fancy product but also to establish a permanent and paying industry. Already the field is sufficiently large and growing to warrant such an establishment.

In giving figures of cherry growing at Sturgeon Bay, I wish to say that my own yields have been duplicated in degree by several other growers and are likely to exceed in the future as my own plant included some kinds I would not plant, notably Dyehouse and Wragg. The latter is wholly unworthy of culture in our locality. Where the plantation consists of half each of Early Richmond and Montmorency the best results may be expected as far as kinds go.

The whole crop of cherries grown at Sturgeon Bay last season was about six thousand cases of which my own crop was

twenty two hundred crates, which is probably the largest crop of cherries grown in Wisconsin by one grower. For the first time in my life I last season suffered a loss from a severe rain with very fine hail that damaged my Early Richmond as they were just opening and soft enough to be hurt by the fine hail. This loss I estimated at fully 25% of my whole crop and yet the balance sold for a little over \$2,000 which is by no means a poor revenue for eight acres. The years previous I had 425 bushels that sold for about \$900; the year before that my crop was 450 bushels and sold for over \$1,400 and besides I had over \$100 worth of other stuff from the same ground, that being the last crop grown besides the cherries in the orchard.

There is one feature of fruit growing that has always been a source of satisfaction to me. And this is one in common with fruit growing everywhere and is well worthy of consideration as regards our influence as citizens of the state. In picking the fruit we grow we give profitable employment to children and women that profoundly influences their lives. While I have satisfaction in knowing that the \$400 I paid out last season for that purpose bought many comforts and necessities into needy families it also was a means of demonstrating to the children their ability, to do, to earn and accomplish, thus giving them a start in the business of getting a living. I have often thought that a child once started as a wage earner can never become pauperized except by calamity, but has acquired at least one trait of good citizenship that of manly independence. I fully believe that fruit culture has a tendency to improve communities and if it can be made to yield a good revenue it is upbuilding as a home making influence.

As far as cherry growing is concerned it has passed the experimental stage at Sturgeon Bay and is now an established industry. We had faith and we planted: we had hope and we cultivated: and because of our faith and hope so manifested, we got cherries!

FIRE BLIGHT AND APPLE TREE CANKER.

H. H. WHETZEL.

CANKERS. WHAT THEY ARE.

During recent years several kinds of cankers occurring especially upon apple and pear trees have been described and figured in bulletins from different experiment stations in this country. By careful inoculation experiments these various cankers have been shown to be due to different species of either fungi or bacteria. Some of these canker diseases are peculiar to certain regions only, others are more cosmopolitan and are apt to be found wherever apple or pear trees are grown. Growers very generally even at the present time attribute such injuries to "sun scald" or "freezing." Lack of knowledge of the nature of fungous and bacterial growths, together with the ease with which responsibility may be shifted upon the weather, has made this opinion the common and natural one. Not only have experiment station workers shown that these injuries are usually due to the attacks of living organisms rather than to the results of weather conditions, but they have demonstrated that the different forms of these cankers are due to distinctive different organisms.

The term "canker" then has come to be a very general one and is applied to diseases which cause the death of definite areas of bark on the limbs and bodies of trees. The diseased area may be smooth and sunken or enlarged and roughened depending upon the nature of the organism causing it. At least six distinct canker diseases of apple and pear trees have been described and figured in recent years. Among these may be mentioned the European canker, very destructive in Europe, not only to apple and pear trees but also to certain forest trees. It also occurs in this country: The New York apple tree canker, very abundant and destructive on apple trees in western New York, the bitter rot canker of the Mississippi valley and the black spot canker of the Pacific coast. Each of these cankers have been proven to be due to distinctive different kinds of fungi. In this paper, however, we shall deal with a canker disease, not caused

by a fungus and differing strikingly from those already mentioned. To this disease I have given the name of blight canker.

The history of this disease in this country covers a period of at least 135 years, having probably first been observed in the highlands of the Hudson in 1770. Its true nature does not seem to have been suspected, however, until 1880. In that year Professor T. J. Burrill of the Illinois State Experiment Station while working on the fire blight of pears and apples came to the conclusion that the so-called "sun scald" spots on the bodies and larger limbs of apple trees were due to the same cause. At a meeting of the Illinois State Horticultural Society in 1881 in answer to a query regarding the nature of "sun scald" he said, "The sun scald on apple trees is the same as pear blight." Similar statements of Professor Burrill upon the same subject are recorded in other places. Upon what experimental evidence if any this and other statements were based I have so far failed to discover. A number of writers since that time have referred to these cankered patches as "body blight" due to attacks of *Bacillus amylovorus*, but none seem to have actually produced the cankers by the introduction of the bacteria into the bark of healthy trees.

THE DISTINGUISHING CHARACTERS AND APPEARANCE OF THE CANKER.

The blight canker while it may occur on trees of almost any age is most destructive on young trees just coming into bearing, trees from 8 to 15 years old. In some sections of the state of New York, notably the upper Hudson River Valley, at least 95% of the trees of this age show cankers on limbs or body. A very large per cent of the affected trees are dead and the remainder are fast succumbing. Very noticeable throughout this section also were the large number of trees with cankers in the crotches where the main limbs arise from the body. Old trees weakened by age and neglect may suffer seriously from its attacks and the dead limbs protruding here and there from the green foliage in old orchards are often to be attributed to the ravages of this canker.

In young trees with smooth bark the cankers are easily detected even in their first stages. They appear as discolored and somewhat sunken areas, the margin along the advancing front being usually slightly raised or blistered. The tissue in actively



A typical blight canker upon the body and main limbs of a young apple tree.



A small pit canker on the limb of an apple tree.



Typical canker formed around a pruned stub, probably infected by means of the pruning knife.



Pit cankers upon the body of a young apple tree. The repeated spreading of the disease year after year has gradually enlarged the original canker until it has become a dangerous wound.



Badly cankered crotches of young apple tree. Cankers also running up the main limbs.



Canker in the crotch and body of a pear tree. Produced by direct inoculation from a canker on the body of an apple tree.



Canker formed around the mouth of an insect burrow at the base of a young apple tree.

spreading cankers is of a darker green than the healthy bark and is very watery or sappy. On damp cloudy days drops of a milky, sticky fluid exude from the cankered tissues through the lenticles or pores in the bark. After a short time the diseased tissue begins to turn brown and dry out. Unless in a very active state of progress the margins are quite distinct, marked by a crack where, in drying, the diseased tissue has separated from the healthy bark. The older cankers are brown, somewhat darker than the healthy bark. They are distinctly sunken. The surface is smooth, never checked or roughened or beset with pustules or pimples, except in the old cankers where after a time rot fungi gain entrance and thriving in the already dead tissue produce their fruit bodies on the surface. The progress of the spreading canker depends largely upon the continuation of favorable weather conditions, which seems to be a *humid atmosphere and cloudy days*. With the return of bright, sunny weather the active spread of the canker is checked abruptly often to be resumed again with the return of favorable conditions. This checking and renewing of activity sometimes results in large cankers with concentrically arranged cracks within the cankered area. This renewal of activity may take place during the same season or the canker may partially heal over to spread anew the following year. A large per cent of the cankers are active during but one season. There are always some, however, in which the disease is perennial, living through the winter to become active again the following spring, spreading and enlarging the original limits of the cankered area. Wait distinguishes these when occurring on pear trees as "hold over" cankers. The diseased bark is usually killed to the wood to which it clings tenaciously the first season. It gradually decays, however, and falls out leaving the wood bare and exposed. In small cankers, the cone of diseased bark may be quickly forced out by the rapidly forming calluses which heal and close the canker wound. In some cases the canker is superficial, never reaching the cambium except perhaps in a limited area at the point of infection. Such wounds heal quickly beneath the dead bark which clings to the tree as a sort of scab.

The cankers vary in size from half an inch in diameter to as much as a foot or more in length and several inches across. On healthy, vigorous trees they are small and more or less circular in outline. They form funnel-shaped wounds with the small end at the cambium. These I have designated as "pit cankers."

Often the dead bark remains as a sort of lid to the pit but it is easily removed with the finger or a knife blade. I have seen young trees with limbs and body literally covered with these pit cankers in all stages of healing over. Aside from affording an entrance to rot fungi such cankers unless they enlarge do not seem to seriously affect the health of the tree. In many cases these pit cankers do not heal properly or at all and the disease spreading the same or the following season forms the large and dangerous "limb" or "body cankers."

"Crotch cankers" usually appear in the crotches where the main limbs arise from the body but may also appear in the secondary crotches well up in the tree. In general characters they are similar to the limb and body cankers. Owing to their peculiar position water is retained more readily in the dead bark, thus affording the very best of conditions for the entrance and growth of rot fungi. These find easier access to the heart wood at the crotch than on the limbs. It was observed that these crotch cankers heal much less readily and successfully than do the limb and body cankers. Crotch cankers unless promptly attended to means the almost certain destruction of the trees.

The large cankers at the bases of young trees frequently referred to by growers as "collar rot" are in many cases very probably due to the same cause as that of the cankers on the upper parts of the tree. The well known "collar rot" of King trees may also be due to the same or a similar organism.

DISTRIBUTION AND SEVERITY OF THE DISEASE.

Since the first specimen of the blight canker was received from the upper Hudson river region early in the summer of 1904, evidence has been constantly accumulating that points to a very wide distribution of the disease. Numerous trips during the last two seasons have convinced me of its very general occurrence throughout the state of New York. Practically no orchard of any size visited has been without some trace of it.

Certain sections have suffered much more severely than others. The accompanying map shows the regions known to be most seriously affected. No doubt other localities have suffered as severely as those indicated but limited time and funds at disposal for this work have made a more extensive survey impossible.

In the Hudson river valley north of Albany the canker has destroyed nearly every young orchard. Throughout this sec-

tion a number of orchards were set some ten or twelve years ago. These were just coming into bearing when the disease began to appear in alarming severity. At first only a few trees died here and there in an orchard but by 1904 the loss had in many cases reached more than 50% and a careful examination of several orchards showed that not less than 95% of the trees were affected. All along the line of the trolley north of Albany and about Saratoga the dead and leafless branches of the young apple trees bore witness to the destructiveness of the malady. The severe winters of 1902-3 and 1903-4 no doubt seriously affected the vitality of the trees, rendering them especially susceptible to attacks of the blight organism. The constant occurrence of the cankers indicate, however, that they were the chief factors in the death of the trees. No dead or dying trees in the young orchards were found that did not show cankers. In one orchard of originally some 400 trees which began to go out in 1903 less than 50 were still alive in June 1905 and but a few of these were entirely free from the canker. The old orchards in this section have also suffered considerably from this same malady and pear trees have almost entirely gone out.

In certain sections in the central and northern part of the state the disease also became epidemic about 1903. The summer of 1902 was a very rainy one in these regions offering the very best of conditions for infection and development of the cankers. No doubt many of them appeared during that time but passed unnoticed by the ordinary grower until their baneful effects began to show in 1903. A few active cankers were, however, noted on trees here and there in these badly diseased orchards. The force of the epidemic seems to have spent itself by the end of 1903, the completing of the destruction being effected by the rot fungi that had gained entrance to the heart wood through the canker wounds.

An examination of the young orchards about Ithaca show a large per cent of affected trees but as yet the disease has not occasioned serious losses. In an orchard of about 350 trees which has been under observation throughout the past season about 85% of the trees show cankers while the actual number of dead trees resulting from its attacks has not exceeded five per cent. It is on the other hand a significant fact that a very large proportion of this five per cent has died during the past summer, showing that the disease is slowly increasing in severity and only awaits a favorable opportunity to become epidemic.

The canker is not confined to New York alone. Reports and specimens from different places indicate that it is more or less common in New Jersey, Delaware, Kentucky, Kansas, Iowa and Wisconsin. What is doubtless the same disease is also reported from Canada. In fact it is safe to say that wherever the "twig blight" form of the disease occurs the "canker" form on limbs and body is more or less common. A study of horticultural and agricultural literature shows that the disease has been destructive not only in nearly every apple growing region of the United States and Canada but also in Europe as well. During the period from 1878 to 1888 this disease under such names as "body blight," "sun scald," "freezing," etc., formed one of the chief topics of discussions in most of the horticultural meetings of the middle west. Conservation and correspondence with fruit growers from various sections of the Mississippi valley during the past year convince me that this region still suffers as severely from ravages of this disease as it did 25 years ago.

HOW THIS CANKER DIFFERS FROM THE NEW YORK APPLE TREE CANKERS.

The New York apple tree canker described by Paddock in Bulletins No. 163 and No. 185 of the N. Y. (Geneva) State Experiment Station, is very abundant and destructive in many orchards, not only of the state of New York, but of other states as well. Specimens of this canker have been received during the past season from Iowa. It is caused by a fungus and is in most respects very different from the blight canker with which nevertheless it is frequently confused. The chief differences between the two are set forth in the following parallel columns:

NEW YORK APPLE TREE CANKER.	BLIGHT CANKER.
Caused by a <i>fungus</i> .	Caused by <i>bacteria</i> .
Usually found on the main limbs of old trees.	Occurring most frequently on the body and limbs of <i>young</i> trees just coming into bearing.
Diseased portion more or less <i>swollen</i> , cracked and <i>roughened</i> .	Diseased area <i>sunken</i> and smooth, not cracked and checked.
Cankered surface <i>black</i> .	Cankered surface <i>brown</i> .
Covered with <i>minute black pimples</i> —the fruit bodies of the fungus; often not so evident in old cankers.	<i>Not</i> showing any <i>pimples</i> or <i>fungus fruit bodies</i> , except in old cankers that have been invaded by <i>saprophytic</i> forms.
Freshly cankered tissue <i>dry</i> .	Freshly cankered tissue, <i>watery</i> .
Cankers <i>perennial</i> , i. e. living over and spreading from year to year.	<i>Large per cent</i> of the cankers <i>active but one season</i> .

HOW THE DISEASE AFFECTS THE TREE.

The effect of the Blight canker upon the tree is to lower its vitality to a greater or less degree by cutting off the food supply to the roots and thus indirectly reducing the flow of sap to the branches and leaves. In other words it acts the same as "girdling." The "collar rot" and "crotch cankers" seem to be the most fatal to the tree. The effects of the canker are first evidenced in the foliage. If there is a large body canker the entire tree may show the effects of the trouble. More often the first symptom noted by the grower is the peculiar appearance of the foliage on one or more of the limbs. Either these branches fail to leaf out at all in the spring, or if they do the leaves never fully expand but remain undersized and curled or inrolled. They never take on the dark green color of healthy foliage, remaining pale and gray. Growers often refer to such trees as having "mouse ear" leaves. As the season advances and the cankers spread, the leaves often die and dry up on the branches. Sometimes badly affected trees will pull through until autumn or even live for two or three seasons. Such trees have scanty foliage, blossom profusely and frequently set a heavy crop of fruit. This fruit falls prematurely or is small and inferior in quality. The picture before you shows a large body canker at the base of one of the main limbs on an old tree. The canker had nearly girdled the limb. This spring the branch was loaded with blossoms to the exclusion of foliage while the other limbs of the tree bore a normal quality of flowers and leaves. Such affected limbs and trees as if in anticipation of their approaching death seem to devote their expiring energy in one grand and final effort to reproduce themselves.

Where the trees are strong and vigorous they frequently succeed in promptly healing the canker wounds. The dead bark of the canker makes, however, an excellent infection court for the entrance into the tree of "heart rot" and other decay inducing fungi. Moisture so necessary to the germination and growth of the spores of fungi, is retained for a considerable time in the dead tissue. This is more especially true of crotch cankers. No doubt these rot fungi are often to blame for the final death of the tree. The heart wood of badly affected limbs and trees is commonly found to be soft and rotten with only a thin rim of sound sap wood surrounding it.

THE CAUSE OF THE CANKER.

A microscopic examination of the viscid milky drops that exude from freshly cankered surfaces on moist cloudy days will show them to be composed almost entirely of minute rod-shaped bacteria. The diseased tissue within the bark will also be found to be alive with these minute plants. By their rapid growth and multiplication within the cells of the bark they cause its death. When the canker dries down they die and disappear so that examination of the tissue of old cankers does not show them. That they are the direct cause of the disease was proven in the following manner: Bacteria from the cankered tissue was introduced into the bark on the body of a healthy apple tree and also into the bark of a healthy pear tree, with the result that typical cankers appeared in both cases. Blossoms and growing twigs of both pears and apples were also inoculated with bacteria from this same canker. These nearly all developed good cases of blight in about ten days, while twigs and blossoms punctured with a sterile needle gave no infection. This last experiment was twice repeated during the summer with pure cultures of the bacteria from the apple tree canker. The blight resulted in practically every case. Young fruits of both the pear and apple were also inoculated and gave well developed cases of the disease. By a comparative study in various culture media of the bacteria from cankers, twigs and fruits of both pear and apple obtained from different orchards about Ithaca the organism of the canker was shown to be identical with that of the well-known "Fire Blight" of the pear and "Twig Blight" of the apple, *Bacillus amylovorus*.

HOW TREES BECOME INFECTED.

Much of my attention while in the field during the past season has been directed to a solution of the problem of how the bacteria gain entrance into the tree. Only those ways of infection which personal observation has discovered are here recorded. No doubt the bacteria enter the bark in still other ways than those I have observed.

Early in my investigation I came to the conclusion that the bacteria frequently get into the bark of the limbs and body by way of short spurs and watersprouts (Fig. 25). The opinion

was fully confirmed later in the season. Twig blight became very prevalent during July and August, especially in the region about Ithaca. It was then an easy matter to find blighted spurs and watersprouts with active cankers about their bases. Where these watersprouts grew out from the trunks as is often the case in young trees, typical body cankers were formed. The infection of the sprout itself is generally attributed to the work of insects which after visiting freshly cankered spots or blighted twigs introduce the bacteria into the succulent tissues of the rapidly growing healthy shoots. The blighted watersprout soon dried up and falls away leaving often a very indefinite scar in the cankered area so that the following season it is usually impossible to tell with certainty the manner of infection. Observation of a large number of trees, during the past season convinces me that the blighting of adventitious shoots on trunk and limbs is responsible for a majority of the cankers in such locations. A number of cankers were produced in this way by artificial inoculation.

Another source of infection was found to be the pruning knife. Along one side of an orchard of some 350 trees which was under observation throughout the season, it was early noticed that the pruned stubs of 1904 especially, showed collars of dead bark often two or three inches in width. Instead of forming a callous and healing over the wound as would normally occur, the tissue had died and shriveled up but still clung to the stub. In most cases the bacteria which had caused the death of the bark had died out the first season. In a few instances, however, the canker was observed to be active early in the spring, extending down the side of the adjoining limb. Two badly diseased trees on this side of the orchard seem to have been the source of infection. Owing to their diseased condition they had been severely pruned the previous season and very probably the knife or saw had carried the bacteria to the healthy trees. Flies which were observed to constantly follow the pruner to suck up exuding sap may have been the direct agents in many cases in transferring the bacteria. Wait states that flies are the pioneers in the distribution of pear blight in the spring. The knife itself may convey the disease as is shown by the following incident. While making inoculations into the body of an apple tree on the station grounds, I had occasion to remove from near the base, a large sprout of several years' growth. This I did with my

knife which I had but shortly before used to cut bark from a fresh canker. A typical canker soon developed about this pruned stub.

Of a similar nature are infections that occur through wounds or bruises on the limbs and bodies of trees. These wounds, commonly known as "barking" may be made by careless workmen when plowing or working about the trees or from the gnawing of animals, one of the worst of which in New York is the woodchuck. A large per cent of such wounds heal over eventually but frequently through the agency of insects or other means these wounds serve as infection courts for the canker bacillus. An interesting case of wound infection came under my observation this season. In cutting a cankered branch from a tree I accidentally "barked" a healthy limb with the cut end of the diseased branch. The tree was not again visited until some weeks later when a large and actively spreading canker was found to have developed about the abrasion. The bacteria were found in abundance in the diseased tissue and pure cultures obtained.

The wounds or punctures of insects seem to be directly responsible for some of the infections. Occasionally cankers on the bodies of trees cannot be attributed to infection through blighted shoots. In some cases these cankers have been traced directly to the wounds made by insects. It is probable that many of the cankers at the base of young trees originated in wounds made by borers. One undoubted case of this kind came under my observation last summer. The bacteria are probably carried to these wounds by flies or other insects which visit these places to feed on the exuding sap and excrement. The infecting agents in the case of crotch cankers have not as yet been definitely located. It seems likely that insects are here again responsible.

As a general deduction, then it may be stated that infection occurs only through a wound of some sort. Moreover the infection court must be of such a nature that it will not dry out quickly. An abundance of moisture is known to be necessary to the rapid growth and development of the blight organism. This peculiarity accounts for the ease with which growing shoots are affected. Where the diseased tissue of an active canker was at once cut out and the wound exposed to the drying heat of the sun without any other treatment, the canker ceased to spread and the place healed rapidly.

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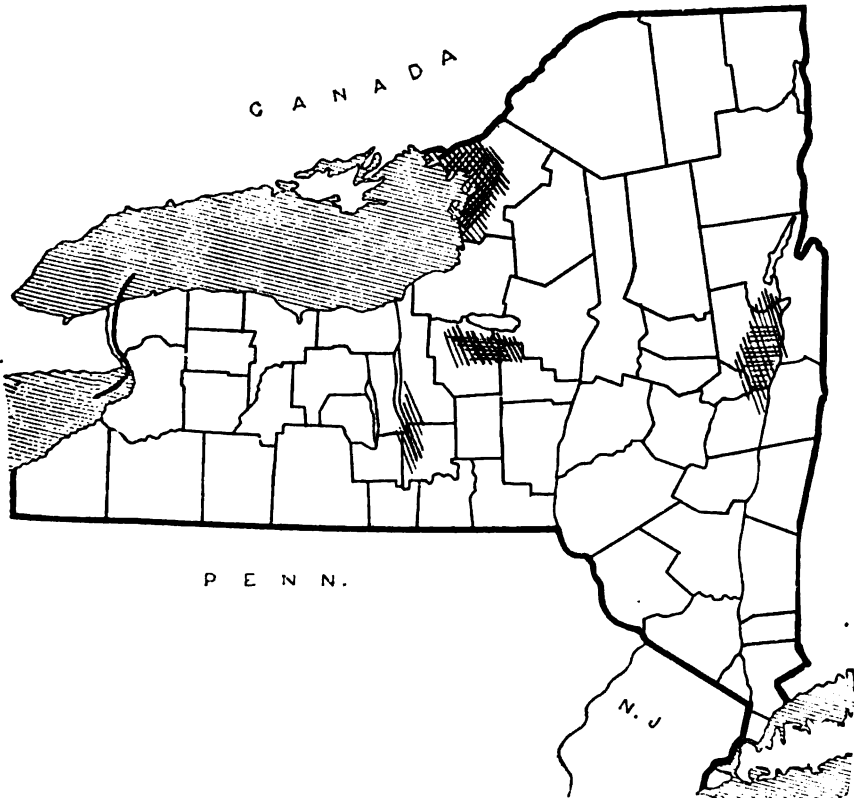
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Showing the effect of the cankers upon the trees, the foliage and twigs dead or dying.



The bacteria causing the blight canker. These are the same as the bacteria causing the fire blight of pears.



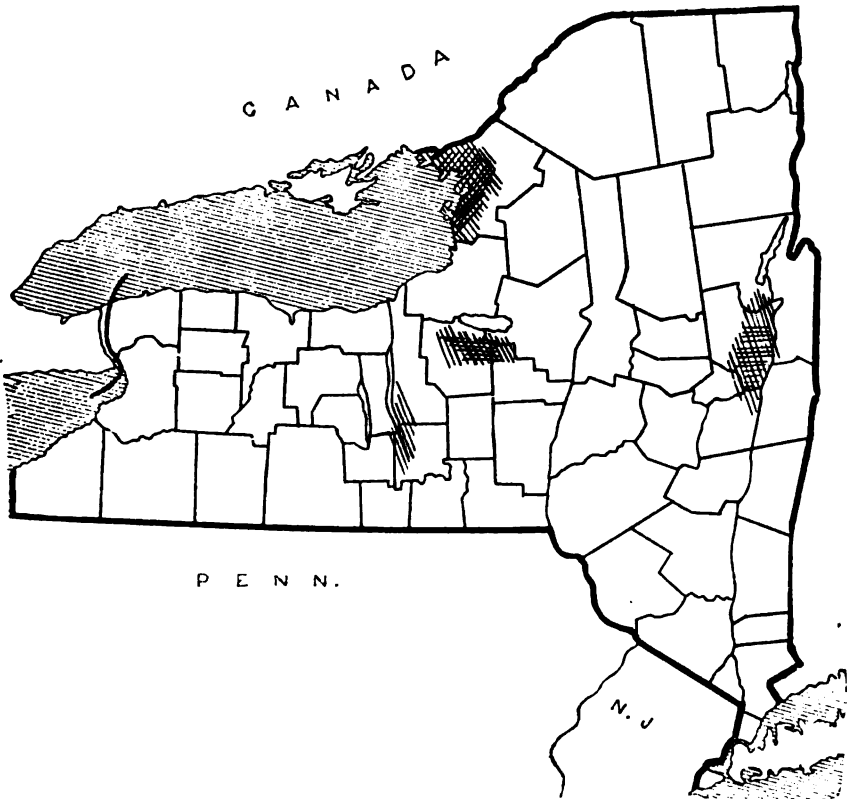
Showing the most serious centers of the blight canker disease in the state of New York.



Showing the effect of the cankers upon the trees, the foliage and twigs dead or dying.



The bacteria causing the blight canker. These are the same as the bacteria causing the fire blight of pears.



Showing the most serious centers of the blight canker disease in the state of New York.

TREATMENT THAT PROMISES BEST RESULTS.

Although the work of the past season has been devoted largely to a study of the various manifestations of the disease, its cause and distribution, still some attention has been given to the means of combatting it. Through the kindness of several growers I have had the opportunity of carrying on some experiments along this line on their trees. Prevention rather than cure is one of the axioms of plant pathology. In most cases the curing of a diseased plant is impossible or its value does not warrant the effort required to save it. However in the case of trees just coming into bearing it seemed that if possible some means of saving them should be worked out. Several things were accordingly tried but the one that so far gives most promise of definite results is to *cut out the cankers*. With a sharp knife remove all the diseased tissue, swab out the wound with a solution of corrosive sublimate (one tablet to one pint of water) or with a 3% solution of copper sulphate (1 oz. to 2 gallons water) and when dry paint over thoroughly with some heavy lead paint. This should be done early in the season as soon as the cankers are discovered, for two reasons: 1st, the spreading of the canker and its consequent damage to the tree is stopped; and 2nd, the wound is thus given a long period in which to heal. The painting should be repeated again toward the close of the season and again the next year or until the wound has completely healed. This prevents a second infection or the entrance of rot fungi. A bi-monthly inspection of every tree should be made and all cankers carefully cut out and treated as soon as they appear. Cankered trees so treated early in the spring of 1905 have formed good calluses and are fast healing the wounds. Practically this same method has been used for some time by Wait in combatting the pear blight. He states that the cheapest and most satisfactory way to control pear blight is to cut out and treat, as I have described, all the "hold over" blight during fall or winter, before sap starts in the spring.

PREVENTATIVE MEASURES.

It is scarcely necessary to point out that every precaution should be taken to prevent bruises or injuries of every sort since these make excellent infection courts for the entrance of the bacteria.

All dead limbs and trees should be promptly removed from the orchard and burned. Old pear trees in the neighborhood of young apple orchards are often a constant source of infection and unless kept absolutely free of the blight should be removed. A neighbor careless in respect to blight in his pear trees is a dangerous one.

Cut out and burn every trace of twig blight from both pear and apple trees as soon as it is detected.

When pruning, treat all cut surfaces with the corrosive sublimate or copper sulphate solution and keep them painted until healed. Treat all accidental wounds in the same way.

Keep the body and main limbs of the tree free of watersprouts throughout the summer.

In planting, select trees with open or spreading crotches.

Avoid excessive fertilizing with nitrogenous manures. Apply some form of phosphoric acid to ripen new growths.

The planting of varieties known to be more or less resistant to this disease is to be recommended. The Wolf River and Talman Sweet appear to be of this sort, while Baldwins and Ben Davis suffer most severely. Desirable non-resistant varieties may be top grafted on to resistant stocks.

A WINTER INDUSTRY FOR FRUIT GROWERS AND MARKET GARDENERS.

PROF. J. G. MOORE.

Winter on a fruit farm or vegetable farm is a season on which the operator finds himself more or less out of employment or at least with considerable spare time on his hands. Many growers would be only too glad to turn this time into money, if some way, not too foreign to their occupation, could be found for so doing. It is the object of this article to point out a method of securing both pleasure and profit during the long winter season without diverging from the path of true horticultural pursuits. The means of doing this may be summed up in either of the two terms, "Vegetable Forcing," or "Growing Vegetables Under Glass,"

The winter forcing of vegetables as a commercial project is of comparatively recent origin, but since its innovation, its growth has been remarkably rapid. At the present time it forms the sole occupation of a large number of men in the vicinity of our large cities and is extending itself even to the smaller ones. Some localities are especially adapted to the forcing industry and in these places establishments using thousands of feet of glass are now in operation.

The subject of growing vegetables under glass is an extensive one and can be treated only in a superficial way in the time allotted to me. As we are concerned with forcing throughout the entire winter months, we must pass over all the minor means of growing vegetables out of season and consider only the forcing house as a means of producing the crops to be grown.

Before doing this, however, let us first consider the probabilities of success in such an undertaking. In the first place, can a man who grows winter vegetables find a market for his product? To this there is but one answer—"yes." To the fruit or vegetable grower who takes up forcing as a winter occupation, there is open two means of disposing of this product—the wholesale market and that afforded by his local market. Where the grower is situated near a city of 5,000 or 10,000 inhabitants, the local market will doubtless prove the more satisfactory.

Take, for example, Madison. There is a fairly good demand for winter vegetables here, yet there is not an establishment in the city which makes an attempt to supply this demand, and the grocers are obliged to ship their products from Milwaukee or Chicago. Nor is the present demand what it should be, for with a local grower, the grocer could be induced to push his products, with the result that the demand would be greatly increased. Madison could well, with a little education in the use of winter vegetables, furnish an outlet for five or six establishments as large as the ordinary fruit or vegetable grower would care to operate. Of course the establishments would necessarily have to handle different vegetables.

What can be done in Madison is only an example of what can be done on a larger or smaller scale in a number of cities of the state. There are in Wisconsin twelve cities with a population of between 5,000 and 10,000; six with 10,000 to

15,000; and fourteen with over 15,000. These thirty-two cities ought and doubtless would, when once a good product was offered regularly, use all the vegetables which the fruit and vegetable growers present, and a large number of others would force, if each had a fair-sized establishment.

Almost the first question which presents itself when one considers entering upon a new project is the amount of capital involved and the probable returns on the investment. For the establishment which the fruit or vegetable grower would care to install the necessary investment would probably not exceed \$3,500. Estimates secured from such firms as John C. Moninger and the Foley Manufacturing Company of Chicago, place the cost of constructing a modern forcing house, and piping the same, at from \$12 to \$14 per linear foot, with an additional cost of from \$300 to \$500 for a heating plant, if steam is used. Thus if a grower wishes to start with two houses 100 by 20 feet, the maximum investment would be in the neighborhood of \$3300. A boiler sufficiently large to heat eight houses would cost about \$500 and thus the establishment could be enlarged from time to time, as desired, without additional cost for a heating plant.

What could the grower expect in the shape of returns upon this investment? It is evident at once that this will be determined largely by the market, but on the average certain returns could be confidently expected. The kind of crop grown also figures somewhat in the profits. Everything considered, with reasonable success, these two houses should return a net profit of from \$500 to \$700 annually, or in other words from 15 to 20 per cent on the investment. Nor have we taken into consideration that at the same time this is allowing the grower \$50 per month during the winter while he is looking after the house and the same amount per month to hire a man to look after them for the remainder of the time when the grower is too busy to do so. With some crops one man can care for a great deal larger area, while with tomatoes two houses 100 by 20 is about as large an area as one man can tend, especially at certain periods of growth.

The heating of houses is one of the factors which must be given a great deal of care if best results are to be obtained. Two chief methods are in vogue and each has its merits and advocates. These systems are steam and hot water. A thor-

ough discussion of the two systems is impossible at this time and we must necessarily be content with a summary of their chief differences. Steam possesses the following advantages over hot water: It is better adapted to crooked circuits; holds heat better and distributes it more readily and evenly; costs 15 to 20 per cent less to install and can be used in larger establishments. On the other hand, hot water surpasses steam in that it requires less fuel, breaks are less apt to occur, it lasts longer and requires no night fireman. There is no appreciable difference in the effects of the two systems on the plants, and consequently the answer to the question of whether hot water or steam shall be used in heating an establishment depends upon whether there shall be a larger cost at the start with smaller outlays for repairs, management and fuel and a longer lasting system or the reverse of these conditions.

Nearly all the vegetables are forced to a greater or less extent, but only four—the radish, lettuce, tomato and cucumber, have assumed much commercial importance. All vegetables which are forced are classed under one of two groups, cool or warm plants. This grouping is determined by the relative amounts of heat the vegetables require to secure the best results. Of the four vegetables just mentioned, two, the radish and lettuce, belong to the cool plants, while the tomato and cucumber belong to the warm plants. It will not be possible to discuss in detail how to grow each of these crops, but a few general principles may be given.

Cool crops require a temperature of 40 to 45 deg. at night, and of 55 to 65 deg. during the day. In addition to this the radish demands a goodly amount of bottom heat to give the best results. Too cool a soil causes slow growth and pithiness; too warm a soil forces the plants to excessive foliage production at the expense of root growth. In all cases houses must be ventilated even in the coldest weather.

Soils differ so much for the various crops that no definite statement can be made which will cover all. Lettuce, particularly the heading sorts, is very exacting in this regard. A soil which holds a goodly supply of moisture without baking or puddling is necessary. One which retains water in excessive amounts in the upper inch of soil is conducive to the lettuce rot, the worst pest which infests this crop. Non-heading sorts are less influenced by soil. A good garden loam with a liberal

supply, say one-fourth to one-third well rotted stable manure, produces very good results. Radishes demand a more sandy soil and yet one which is retentive of moisture. It should be fairly rich but should not contain too much nitrogen as this fertilizing element is apt to produce an excessive leaf growth.

Watering is one of the most important factors in growing crops under glass. The great tendency is to water too often. If the soil is kept in a proper condition of tilth, the upper surface of a bench may appear dry while the soil an inch deeper may contain a sufficient amount of moisture to answer the requirements of the plants. If water is given too frequently the soil is kept damp and soggy, air is excluded and the plants suffer as much, if not more, than if they were allowed to show slightly the effects of the lack of moisture before it is given. We make a practice of soaking the benches thoroughly when we apply water and then let them go for a period before giving a further supply. In this way we have been able to bring a bunch of lettuce into a marketable condition by the use of three applications of water. With the use of bottom heat in growing the radish, care must be taken that the under portion of the soil does not become absolutely devoid of moisture before the upper inch or so shows such a condition. With bottom heat it is possible to have the bottom soil of a bench dry and the surface soil quite moist.

The warm crops, tomatoes and cucumbers, require more attention than the cool crops. Their temperature requirement is from 60 to 65 degrees at night, and 75 to 85 degrees during the day. Bottom heat is necessary for the profitable production of either. Ventilate whenever the temperature reaches 80 deg. or above.

In soil requirements neither is as exacting as head lettuce. A rich garden loam—3 parts garden soil and 1 part well rotted manure—answers the purpose well. As soon as the plant comes into bearing liberal quantities of liquid manure are applied after the benches have been thoroughly watered. This manure is prepared by placing one bushel of fresh cow manure in a barrel and then filling the barrel with water. This fertilizer should be applied at intervals of 10 days. Both of these crops require training and hand pollination, the details of which are too numerous to discuss at this time.

The forcing of most vegetables is not as difficult as is gener-

ally supposed. Neither is it an occupation which invites a man who is not willing to put good hard work into it. Every crop which we try to force has several insect and fungous pests and a crop is produced only through continual vigilance, and the careful attention of an energetic and reliable man.

SPRAYING FOR POTATO BLIGHT AND ROT.

JAMES G. MILWARD.

The potato industry in Wisconsin is handicapped by three important enemies, namely, the early blight (*macrosporium solani*), the late blight (*Phytophthora Infestans*), and the common potato beetle. I shall confine myself entirely to some practical problems concerning the control of these three enemies.

First, what is early blight? The term "blight" is often very broadly used among potato growers, even to the extent of calling any early withering of the vines blight. Early blight proper is caused by a semi-parasitic fungous, *macrosporium solani*. It seldom attacks the healthy vine directly, but gains entrance after the vine has become weakened by injury. Hence its prevalence during seasons of serious damage from the beetle. The appearance of yellow leaves and dark circular spots upon the foliage indicates the early presence of the disease.

Under favorable conditions this appearance may develop to the extent of giving the entire field a speckled and blackened appearance. The stalks turn yellow, grow spindly, and ripen prematurely several days in advance of the season. During unfavorable seasons for fungous development, the disease may exist unobserved during the period of most active growth, and later multiply rapidly at the expense of the forming tubers. A microscopic examination at this stage will show the presence of thousands of club-shaped conidia in the tissues of the plant. The name, "Early Blight," is misleading because its effects may be most noticeable during the months of August and September. It must be remembered also that the fungous does not attack the tubers directly, but the yield results in an inferior grade of potatoes, with a high percentage of culls.

Quite in contrast to early blight, late blight is caused by an active, virulent, parasitic fungous (*Phytophthora Infestans*). The disease is a native of the wild potato vine of South America and was introduced into Europe, early in the 19th century. In 1845 it swept over Germany and the British Isles as an epidemic, causing practically the loss of the entire crop. Due to its economic importance in these countries, the life history of the fungus, as far as it is now known, was early worked out by German and English horticulturists and scientists. The greatest advance toward the control of the disease has been made in this country in recent years, due in part to the production of efficient spraying machinery, suitable for large commercial plantations.

Moist, warm weather during the months of August and September is especially favorable for the development of the late blight fungus. Under these conditions, in two days' time, the disease may turn an apparently healthy field into a mass of putrefied and blackened vines. A most unfortunate feature of the disease is that it not only destroys the vines, but the summer spores may gain entrance to the tubers and cause serious damage from rot. The rotting of potatoes in storage, which is very generally attributed to the late blight fungus, is very likely due to bacterial causes. The relative importance of the early and late blight fungus to the Wisconsin potato industry is not definitely determined. The loss from early blight is more steady and it is probable the disease does more or less damage every season. Late blight appears more periodically, but when it is present, it causes more serious damage to the yield.

The success of any commercial spraying venture depends upon the efficiency of the selected fungicide in controlling the disease and upon the actual increase in profit, which can be realized above the cost of treatment. In New York state several potato growers are co-operating with the experiment station to determine the profits under actual farm conditions. A report of that work for 1905 estimates the cost of each application at 90 cents per acre. They obtained an average increase of 58 bushels per acre, which netted an average profit of \$22 per acre. Later reports indicate that potato spraying has made rapid progress in that state and is becoming quite general among the progressive growers.

Probably no spraying operation of the horticulturist or gar-

dener can be accomplished as rapidly, as cheaply, and as efficiently as can potato spraying. The machines have reached a high grade of perfection, making it possible for two men and one team to cover thoroughly about 25 acres in one day. Also, combining a poison with Bordeaux mixture not only facilitates in controlling the bugs, but also divides the cost between the two treatments.

One of the results of the potato spraying agitation will be the introduction of better methods in fighting the beetle. Serious loss resulted in the state last year, due to the clumsy and careless methods of applying Paris green. The past season's experience shows that Paris green applied with water is a failure. In several potato districts outside the state home-made arsenic compounds seem to be supplanting Paris green. These will undoubtedly be combined with the Bordeaux next season in Wisconsin for the control of the beetle.

Wisconsin is the second state in the union in potato production. During a normal year the crop approximates 30,000,000 bushels. Last year that yield was probably reduced one-half, due to a combination of the causes I have mentioned. The year proved a favorable one for practical field demonstration, under ordinary farm conditions. The season proved conclusively that a timely, intelligent application of Bordeaux mixture will prevent the blights to which the potato vine is subject. The profits realized above the cost of treatment were highly gratifying. Statements regarding the cost of treatment, time and number of applications, and profits, will seem less arbitrary, if brought out in the discussion.

Potato spraying gives promise also of arousing the farmers along the more general lines of improving the industry. In many localities the crop suffers severely from drought. Continuous cropping to potatoes in many sections has reduced the fertility and water-holding capacity of the soil. The greatest progress in the potato industry will result in combining spraying, with more rational methods of conserving the soil fertility. This will mean that the potato grower must introduce stock raising more generally into his system of farming, combined with a rational use of commercial fertilizers. The bugs and blight may drive the careless grower out of the business, but the successful grower may find *these* the indirect source of his profit.

REPORT OF FRUIT GROWERS' EXCURSION TO SOUTHWESTERN TEXAS.

E. P. SANDSTEN.

Early last year I received an invitation from the officers of the "Cotton Belt Railroad" to join a fruit growers' excursion from St. Louis to southwestern Texas. Through the kindness of this society I had the pleasure of joining the excursion at St. Louis June 22nd. The party was made up of delegates from practically all the middle and eastern states. The object of the excursion was to make the fruit growers and horticulturists in the aforementioned section acquainted with the great possibilities afforded, by the favorable soil and climatic conditions of southwestern Texas, for the growing of peaches and early truck crops.

The excursion was timed so as to reach Texas in the height of the peach harvest, in order to give the party a chance to see the country at its best. I may say that in this respect the excursion was a failure for we arrived at least a week or ten days before the opening of the season and we were thus deprived of seeing and judging of the quality of Texas peaches.

A special train left St. Louis at 8:30 P. M. and we arrived at Jonesboro, Arkansas, at 9:00 the following morning, where we had breakfast. During the day we traversed through the whole state of Arkansas and all of us were forcibly impressed with the story of the Arkansas traveller. The section of Arkansas traversed by the "Cotton Belt" railroad is almost level, in fact so level that drainage in some instances appeared to be impossible. The soil appeared to be of a clayey nature with some sand in it, but devoid of humus and generally poor. The principal crop grown is cotton, which did not look very promising. Only a relatively small portion of the land is under cultivation, and with few exceptions the farm buildings and negro cabins corresponded with the general aspect of the country.

We were to have taken our dinner at Texarkana—a city deriving its name from the fact that one-half is built in Arkansas and the other half in Texas—but were late a few hours and had to take a premature supper instead. The famous Razorback

hog and the darkey were familiar objects in the landscape. In fact, they constituted the larger part of the population. From Texarkana southward the country began to assume a different aspect, becoming more rolling and sandy.

Our first destination was Tyler, Texas, at which place we were scheduled to arrive at supper but it was after 11:00 P. M. when we finally arrived. The delay was due to the soft road bed and to the fact that our engine left the track twice. We stayed at Tyler over night and were well cared for by a typical southern landlord with a broad expanse of white shirt bosom.

At Texarkana a number of real estate agents joined us and made life miserable for us the rest of the journey. The number of agents was increased at every stop we made, and each one endeavored to persuade us that southwestern Texas was the promised land and that we ought to own a section of land. I might say that in this attempt they were not successful as we saw no streams of milk and honey.

We left Tyler at 9:00 o'clock the following morning on our special train and arrived at Morrill, our destination, a station named after Mr. Morrill, the famous Michigan peach grower, who met us with conveyances. Mr. Morrill & Co. own 13,000 acres of land in and about Morrill and about 3,000 acres are now planted to peaches, over 2,000 acres will be in bearing the coming year. The great peach section extends from Tyler southward within 100 miles of the Gulf, the largest orchards occurring around Morrill, where a number of northern men have large plantations. A number of these plantations are now in bearing. The lay of the land at Morrill is very fine and the soil is a sandy loam, and an ideal peach and trucking soil. The wild land is generally covered with shrub oak, chestnut, pine and under brush. There can be no doubt but what the land is admirably adapted to peaches and truck in general. This has been amply demonstrated in the last few years.

The great advantage of this section for peaches and truck is that the crop comes on the market in advance of all other sections and hence brings a higher price. At the time of our arrival the melon and tomato season was over and sweet potatoes were planted on the land before occupied by these crops. The only apparent drawback to the development of this section is the lack of adequate transportation facilities and labor. I am inclined to believe that the number of very large orchards

planted will not be uniformly profitable and disastrous results to many orchardists are quite certain to follow. Trucking and orcharding on a moderate scale will undoubtedly prove very remunerative if not over done.

Before dinner we inspected the home orchard of Mr. Morrill and found the same to be in some excellent condition. A fine dinner was provided for by Mr. Morrill in which all partook. The afternoon was devoted to the inspection of a two thousand acre peach orchard about three miles from the station. In this orchard the peach trees were of the age of three and four years. They were very uniform and were well cared for. In fact it was said by those who have visited all the peach growing sections of America, that this peach orchard of Mr. Morrill's was the most perfect peach orchard in America. The land is almost level and composed of sand and loam. As stated it was located about three miles from the station and Mr. Morrill has spent several thousand dollars in building a turn pike out to the orchard. The turn pike may in the future be turned into a railroad track in order to facilitate ready transportation of his crop to the station. Mr. Morrill does everything on a large scale and is eminently successful in the management of his orchards and his men.

The labor problem is at the present not a very serious obstacle but is bound to be so with the rapid growth of the industry. Mr. Morrill has a contract with the state for sixty convict negroes who work every working day in the year at the price of \$1.00 per day, if I remember rightly; the state to care for the convicts and to supply guards and be responsible in general for their conduct. It was a pathetic sight well worth studying from a socialistic point of view to see sixty convicts lined up and planting sweet potatoes after the removal of the tomato crop. In front of the convicts were three guards with Winchester rifles and behind them the same number similarly equipped. On either side was a man with half a dozen blood hounds to prevent any negro from absenting himself. The foreman informed us that this type of labor was worth twice as much as ordinary white help obtained. These convicts will work incessantly for ten hours and the amount of work accomplished is astonishing to a northerner.

In speaking on this subject later to a citizen, the interesting fact was brought out that the question of convict labor in Texas

and other southern states was becoming a serious matter, the state making considerable money out of the convicts, since the cost of maintaining them never exceeded \$.50 per day, thus leaving \$.50 per day in clear profit to the state. While this may be economy for the state in caring for its convict population, it has another demoralizing side. It was intimated that the negroes in some sections were arrested and convicted for the smallest offense with little show to escape punishment and subsequent labor. The labor contracts are given to the higher bidder and there is a keen competition among the large planters to obtain all the help that they can from the prisons. In fact, the demand is greater than the supply and hence the remark of the person regarding the chances of the negro population in this section.

We were all greatly disappointed in not being able to partake of the luscious peaches which appeared to be very inviting on the tree. A mistake was undoubtedly made in not timing the excursion right.

In regard to the advantages of southwestern Texas for northern settlers much can be said, both on the side of Texas and against it. The white population are certainly desirous of having northern immigrants and undoubtedly would make the social life as pleasant as is possible under the existing conditions. There is no doubt but what there is a future for this section for people who intend to engage in early trucks with a small orchard of peaches, and from Mr. Morrill's statement I learned that he has been able to pay for all the improvements and expenses from trucks, such as tomatoes, sweet potatoes and musk melons. In fact, the field of trucking appeared to me more promising than the growing of peaches. I could not help but feel that the large peach growers in this section will suffer severely from lack of adequate transportation facilities, and also the cost of transportation and refrigeration from Texas to the north, which is very high. A statement was made that the cost of a car load of peaches from Morrill, Texas, to Chicago would be in the neighborhood of \$150 up to \$200 and \$225 to New York and Boston. This heavy charge will make a heavy inroad upon the net profit of the orchard. Mr. Morrill himself did not feel sure of the financial success of his venture though he hoped to be able to make a success of it. I feel at the present at least peach growing on a large scale in Texas is yet in the experimental stage and that in the next few years the question will be settled.

QUESTION BOX.

1. When and where was the State Horticultural Society organized? Give names of some of its members.

The Secretary: There is on file in the Secretary's office a copy of an old book, a report of which I think there are but few in existence, which states that the State Horticultural Society was organized in 1865. Now, there may be some here who will dispute that statement. The State Fruit Growers' Association was organized in 1853, which was really the beginning, I think it was at Whitewater a number of men met, among whom was George J. Kellogg and they held successful meetings and exhibitions for a number of years. Then at the beginning of the war the society lapsed and at the close, in 1865, when agriculture and horticulture began to attract more attention, they reorganized here at Madison, in the old Assembly Chamber, in 1865, and the society has been in existence since. In regard to the second part of this question I would refer the inquirer to our annual report, which contains the names of 350 annual members and about 35 life members. If the question meant charter members, that is a different question, that I cannot answer. I do not know that we have any other of the original members than George J. Kellogg living, I think he is the only living charter member of the State Horticultural Society. Mr. Kellogg is this winter on the Pacific coast.

2. Information wanted on the Red Cross Currant.

Mr. Street: I got it from Nebraska and have had it only about three years. I think it is one of the largest we have, a red currant of good size and bearing well.

The President: Is it one of the old ones named over?

Mr. Street: Well there are a good many of those that I am not familiar with. It is different from any I have.

Mr. Smith: Is it larger than the Prince Albert?

Mr. Street: A little larger than any on the market, I think. It stands up first rate.

Mr. Underwood: We have not tested the Red Cross Currant in Minnesota very much. I believe some of our Lake Minnetonka growers consider it a very good quality, but we have not had it long enough to be able to say it is the best currant. We think a great deal of the Prince Albert up our way. After trying some

of the newer currants, we have fallen back on that as the best market currant.

The President: Who originated the Red Cross, do you know?

Mr. Underwood: I do not know; the original stock that we got came from Ohio, from Dustin (?) I don't know whether he originated it or not, I do not believe so.

QUESTION BOX.

1. Three best varieties winter apples for southern Wisconsin. North slope with west protection.

Mr. Moyle: In southern Wisconsin under those circumstances if I would plant an orchard from three varieties, I would plant Fameuse, McMahan and Golden Russet.

2. What kind of soil is adapted for walnuts?

Mr. Coe: Rather low, rich, black soil.

AFTERNOON SESSION.

IOWA'S SHARE WITH SEEDLING APPLES.

MR. REEVES.

At the present time we are looking hopefully for the advent of not only one apple that shall be a valuable addition to our list, but for a list that shall include varieties of high quality for all seasons and all the various locations where apple growing has been so hazardous in the past. A few years ago we knew not where to turn for such a list and all parts of the earth were searched in hope of finding ready-made, the varieties we desired. We forgot for the time that other sections had produced their own varieties from seed and that even New York had her difficulties until her fruit growers by a liberal planting of seeds, originated their own list of apples suited to their conditions.

However, with them as with other eastern sections the climate was less severe than through the west and a hap-hazard planting sufficed to bring the desired results and no foundation principles were studied out to guide those who came later or those of regions where the difficulties were greater.

Having failed to find a ready-made list we have again turned to the production of seedlings and now begin to see the solution of the problem for us.

All through the northwest each neighborhood has its seedling varieties and every fruit exhibit brings out a number of more or less value. Many of these are small, of poor quality, poor growers or tender in tree or with some other fault that render them of little value.

But many people are interested in this matter and are planting seeds and looking for a prize to come forth.

Among fruit men the question is often asked, "what is your state doing in this work?" I can answer for Iowa that like other states each neighborhood has its seedling orchards and its favorites that are locally of great value and many are gaining a wider reputation. It would be impossible to name all that are claimed to be valuable and worth planting but among the best a few may be mentioned. Red Warrior, Prices Choice, Rankin, Ivin's No. 1 and No. 15, Ivin's Pipin, Stuart's Winter, Chisman, Adamson, Greggs, Hinkley, Clemons, Okoboji, Iowa Greening, Merritt, Banks, Winfrey, Ideal, Delicious, Old Dubuque, the Reigler collection among which are about fifteen valuable ones, one of which is a choice sweet apple, the Thompson seedlings long famous, and from Mr. Patten we have Patten's Greening, Arthur, Eastman, Brilliant, Summer Pear, University, Iowa Beauty and many others.

These named varieties are becoming well known and have decided merit. Old Dubuque is from a tree found growing near Dubuque by the early settlers and is a choice long keeper of medium size and should be well known. As to quality Delicious is the best ever grown. It is a Madison county seedling and in tree appears to be able to stand all through the state. Patten's Greening, a seedling of Oldenburg, is too well known to need description here. It is now one of the standards for home use and market. It is a choice cooking apple and sells at the highest price and the tree is as reliable as any we have from central Iowa far to the north.

On the college grounds at Ames are several thousand seedlings of various ages. Many of these are selected seedlings giving promise of value while a large portion are of known parentage, the result of work done by students and others under the supervision of the college and the Iowa State Horticultural Society and this line of work is being enlarged each year. Many people through the state are planting seed from known crosses or selected specimens and are on the alert for a valuable find. However, it is to C. G. Patten of Charles City that we must give credit for long continued and persistent work in the planting of seeds, making numerous crosses and studying the principles upon which this work depends. Not content with simply planting and waiting for results he has by long-continued study developed rules to aid in the selection of the parents for future crosses. He has on his grounds a large number that come from such varieties as Fameuse, Oldenburg, Grimes Golden, Johnathan, the Russetts, Ben Davis, etc., and among his later seedlings his own Greening figures largely as a parent. If we had nothing outside of his grounds we should have no need of discouragement, but still he plans to continue and enlarge his work. In the field of producing new varieties he stands as the peer of the famous Burbank of California with this difference. Luther Burbank is working in a mild climate where nearly every plant produced is hardy and will do well in some portion of the field he covers. The question of hardiness does not enter into his calculations until it is time to decide where a new creation is to find a field of usefulness. In his mild climate it is comparatively easy to produce new fruits but a mild climate will not develop hardiness which is the main requirement in this cold prairie region.

Mr. Patten, located in the central portion of a greater prairie has a severe and changeable climate to contend with. A new variety may possess all the good points required except the ability to stand a rigorous climate and it is worthless to him.

How much greater patience has it required for Mr. Patten to study and work away for these thirty-five years with all the discouragements that nature has placed in his way and answer the remarks of men of lesser faith and works, keeping meantime a brave determination to solve the problem of producing a suitable fruit list and formulate rules to guide others in later years.

His Greening has already been mentioned. The Brilliant is

a pure Fameuse seedling and the best of the many I have seen. It shows the improvement in leaf that seedlings in this climate are inclined to and a vigor of tree as well, a seedling of Tetofsky and one from the Golden Russett as well as many others show the same improvement in leaf and general vigor.

Among his seedlings from Ben Davis is one crossed with Johnathan that is a treasure. The crosses with Grimes Golden are among the valuable ones and several of these with a Greening cross are long keepers, of good size and desirable quality and in tree appear to closely follow the Greening.

Many others might be mentioned but perhaps this is enough to indicate that Iowa is in the procession and trying to do her full share in this work.

QUESTION BOX.

(1) Which two varieties of plums are best to plant in Sauk County, on north slope, clay soil, to fertilize one another? Hardy varieties considered?

Mr. W. A. Toole: I think for a choice I would take Surprise and Quaker, although there are so many different varieties that it would be hard to name any two that would best.

(2) My young apple orchard on rolling clay soil raised a crop of wheat last year seeded with clover. Had I better plow it in the early spring, or hoe around the trees and plow in June and plant to corn, thus turning under a crop of clover, as the soil needs fertilizing?

Mr. Goodman: Do so by all means, plow under wheat and clover and then cultivate the trees well and put in corn. Corn is one of the best crops that can possibly be grown in an orchard.

Mr. Chappel: Corn or potatoes will do.

(3) Would you recommend Bordeaux mixture for summer leaf blight for the raspberry?

Mr. Rowe: It will take off your leaves.

Prof. Beach: I am not sure that I know what trouble the gentleman has in mind in speaking of the blight on the black raspberries. Raspberries I believe are sometimes affected with the pear blight, they more often have a leaf spot that makes

small spots in the leaves. I do not believe I would undertake to answer the question, because I am in the dark as to what the gentleman has reference to.

Mr. Swartz: My blackberries looked first rate until about picking time, then the leaves turned light and dropped off and sometimes that interferes with the crop. They turn yellow, they do not turn black. It is gravel soil.

Prof. Beach: Let me ask you, have you observed the canes, have you anthracnose or blight on the canes?

Mr. Swartz: We have anthracnose, but I do not think that is the cause.

Prof. Beach: In case of a general yellowing of the leaves as you have described, I should look for some root trouble or cane trouble that you cannot handle by spraying with Bordeaux mixture. I would advise you to send some specimens to your experiment station, and let them see what you have to contend with and they can advise you what to do with it.

Mr. Swartz: The canes seem to be strong, the roots seem to be strong and nice. The leaves drop right in the picking time.

Mr. Rowe: I think the trouble is with the roots. I do not think the trouble is with the canes.

(4) If a shy bearing variety of apple is grafted on a heavy bearing variety, will it have any effect on the bearing habit of the shy one?

Mr. Periam: The scion carries the blood of the fruit, the influence of the stock upon the graft is very slight. It is a question that is open yet, as far as I am informed, and probably always will be: it is a very deep physiological question.

Mr. Brackett: I think that in grafting, a tree that is a very strong grower and for that reason does not come into bearing so young, might be grafted onto a stock that would dwarf it somewhat and make it bear more readily.

The Secretary: This question relates wholly to bearing.

The President: Prof. Brown, can you give us some light on this question?

Prof. Brown: From my observation, and as far as we are able to learn from those who have studied the subject very thoroughly, there is no great influence in regard to shy bearing of fruit, of the stock upon the scion. There is supposed to be some influence on quality where a scion is grafted upon a stock of wild crab.

Mr. Moyle: I think we will have to admit that as a rule a shy bearing variety grafted upon a heavy bearing variety will affect the shy bearer and make it bear, simply for this reason: Let us reason back, what is the result, what is the growth of the tree, that as a rule, is a heavy bearer? We find as a matter of course that that is a slow grower, and it has that influence, if a shy bearer is grafted upon a heavy bearer, to check the growth, and as a consequence of that we will get fruit earlier on our shy bearing variety. That has been my experience.

Mr. Goodman: It will depend on whether the shy bearing of that variety was on account of its rapid growth, or whether it was on account of the lack of pollen, or upon lack of fertilization. That would be the point to be considered, whether or not it was due to the fact that the tree grew too rapidly. If it was just because of the growth of the tree, then if it were grown on a tree that would dwarf it or check it a little, that would cause it to fruit better, anything of that kind. If a tree does not bear, make it bear. There is no tree but what you can make bear, and bring them into bearing yourself, either by very heavy summer pruning, or by girdling and girdling is as good a way to treat an orchard if it does not bear as cultivation, or to improve in any other way, and we use girdling as part of our orchard work just as much as we do pruning, just as much as we do cultivating, so that if this variety is deficient in pollen, or not a self-fertilizer, why, that is one question, and if it is because of rapid growth, that you can overcome by grafting on a slower growing variety, or by girdling the tree.

Mr. Smith: One object of that question was to know if there is anybody here that has practiced that and knew whether it worked? I do not care especially in that about the theories, the why and wherefore, I want to know the facts, and what led to that question is this fact: We have growing side by side, about eight feet apart, a Grimes Golden and Duchess apple trees. The Duchess bears as the Duchess would do, and the Grimes Golden grows about, as far as I can make out, as they usually do, not any to speak of, and a few years ago I took a couple of slips of the Grimes Golden and stuck them into the Duchess, forgot all about them; a few years after I noticed they were full of apples, and the thought came to me, as that

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Duchess made that Grimes Golden graft bear, whether there was an influence of any kind there that could be made use of.

Prof. Brown: I would like to enlarge upon that a little, and say that many times trees that are shy bearing in themselves, say, like the Baldwin, one that I am very familiar with, if planted in gardens composed entirely of Baldwins, they will not have very good crops, but if they are top-grafted with trees that are pollenizers, then they are good bearers. Now, this whole matter may not be a setting of a scion into a certain stock, but it may be a matter of cross-pollenization; that is what it is in most cases.

Mr. Hatch: I want to arise to correct one mistake that is being made. It is taken for granted that the fast growing varieties are all shy bearers, which is not the fact. The McMahan's white is one of the strongest growers we have, and one of the heaviest bearers, and there are other varieties just the same.

The President: I want to say that perhaps in your putting that scion in there, you got a hardier scion than it would have been on the parent tree, and that perhaps the winters affected the parent tree so that it would not bear as much.

Mr. Periam: That is another phase of the question.

(5) What is the matter with strawberries that causes the leaf to commence rolling up soon after they commence blooming, and dry up before the berries ripen?

Mr. Richardson: I should say that that is the leaf roller, if I understand the disease right, something that is very prevalent is this state. It is not doing a great deal of damage at the present time, but that seems to me to be the symptoms of leaf roller. I know the leaf curls up tight, if you open it up you will find inside the leaf roller, which is a small green worm. That is one of the problems that I think them strawberry growers of Wisconsin will have to face at the present time, it seems to me the leaf roller is one of the most dangerous enemies we have got to fight in the strawberry business.

Mr. Crawford: I was at the Ohio Experiment Station last June to see their berries, and perhaps one-half of all the varieties they had were curled up in that way, not only curled up, but mouldy; they were in very bad shape. They do not seem to understand yet just what it is. What they had is not the leaf roller, we are acquainted with that, but it was a very serious matter. It is a new plantation on land that had been

used for vegetables, and the plants were in very bad shape, some varieties did not have one good sound leaf in them.

The President: What is your solution for that?

Mr. Crawford: Well, I have not any.

Mr. Periam: The natural solution would be that the garden ground was excessively rich in humus and that might produce a fungous disease.

Mr. Brackett: I have been in the strawberry business all my life and have had a great deal of experience in Iowa, South Dakota and in Minnesota, and more particularly in South Dakota, where we have our strawberries go into winter quarters dry, the ground is perfectly dry, and in such cases as that we have a great deal of root killing; while it may not kill the plant out entirely, it kills a majority of the roots; your crown may be alive and enough of the roots alive to start the plant into growth, it will throw out a few small leaves and sometimes the blossom bud will come open and the berries will form, it may be so, you will not get any blossom, and it may be so it will form a blossom and form fruit and may be you will get one picking off the vines, and your vines dry right out and your crop will dry out in short order. But if you will investigate that, nine times out of ten it is caused by the roots being injured by winter. I have seen acres of berries that have been hurt in that way, both in Dakota and Minnesota, and last winter that was the trouble with our strawberry crop in Minnesota; our crowns came out in the spring looking well and they started to grow, but in digging the plants we found a great many of the roots were injured, and when they came to fruiting we got one picking, and then the leaves shriveled up and dried up.

Further questions on strawberries were postponed, to be considered in connection with the other strawberry subjects on the program.

WEDNESDAY—MORNING SESSION.

REPORT OF DELEGATE FROM EUREKA LOCAL SOCIETY.

EVA LOOPE.

To the officers and members of the Wisconsin State Horticultural Society:

Rushford Horticultural and Improvement Society was organized on Feb. 19, 1893, and we have been very much alive all these thirteen years.

We now have a membership of about 65. We lost one faithful member by death, last May, one who was always in his place and who will be greatly missed as a charter member of the state society. I refer to Henry Floyd, one of the most enthusiastic and untiring workers our society possessed.

We hold our regular meetings on the first Saturday in every month and the kind leading members generally have a fine dinner for us.

You have all noticed, no doubt, how our state meeting is almost exclusively composed of men but in our local society the women are in the majority and keep up the interest by their untiring efforts.

Last June we had a strawberry festival and later we held a fruit and a flower show. Both were well attended, and much interested was manifested.

Luther Burbank of California was made a most interesting topic at a couple of our meetings. Our president for the year of 1906 has not yet been elected as we failed to hold any meeting this year—so the old officers hold over Dr. Loope, president and H. H. G. Bradt, secretary.

REPORT OF DELEGATE FROM OMRO HORTICULTURAL SOCIETY.

MRS. JAS. STEAD.

OMRO, WIS., Feb. 2, 1906.

The Omro Horticultural Society respectfully submits the following report for the past year.

Our society has held eleven meetings and our programs for the year have been both instructive and interesting. We have a membership of 70 besides a fair attendance of the young people who assist in the programs at different times.

At the Annual Meeting held January 12, the following officers were elected:

President—Henry Ross.

Vice President—A. Marshall.

Secretary—Mrs. Jas. Stead.

Treasurer—Mrs. W. J. Jenkins.

Delegate to Winter Meeting, Mrs. Jos. D. Treleven; Alternate Delegate to Winter Meeting, Mrs. A. B. Freese; Executive Board:—Chas. Oak, W. Ward, Mrs. Lester Stead and Mrs. A. Hyde.

REPORT OF ALGOMA SOCIETY.

L. J. ATHEARN.

To the Officers and Members of the Wisconsin State Horticultural Society:

The Algoma Horticultural Improvement Association has just closed the sixth year of its existence, a year marked by harmony and good works.

The society had at the close of the year an enrollment of about seventy-five members.

The officers for 1906 elected at the December meeting are: President, J. C. Davis, Vice President, Austin Payton, Secretary, S. J. Athearn, Treasurer Chas. Phillipson.

Following are the members of the executive committee who are appointed by the president and who with the officers form

the executive board: John Athearn, Mrs. Jessie Moon, Geo. Jones and Mrs. E. A. DuBoise.

The society meets regularly on the second Tuesday of each month. All the meetings are held at Grange hall which is located about two miles west of the city of Oshkosh.

This hall has many advantages as a place of meeting over a private residence that in the opinion of the members, amply repay the cost of rental which is \$2 per evening. It brings the members all together in one room facing the president's desk so that all may hear, see and pay attention to the program. There are sheds for the protection of teams during the meetings and the hall is provided with facilities for serving the basket lunches which are served at each meeting.

Besides the regular monthly meetings there is an annual public dinner which is given sometime in March. These events are always well attended and are made an occasion for recruiting our membership.

Our society learned with pleasure early last season that our invitation to the state society to hold its summer meeting in Oshkosh had been accepted. The various committees appointed to make arrangements for the summer meeting worked faithfully and harmoniously to make the summer meeting of August 29, 1905 a success.

The expense incurred in the entertainment of the state society placed our society slightly in debt, but a small assessment on the members followed by a successful box social enabled our society to meet all its obligations and have a small balance in the treasury at the end of the year.

The discussions in our society are not confined strictly to horticultural topics, as our membership contains patrons of all branches of agriculture. Informal exhibits of fruits, flowers and vegetables are made at the meetings in season.

The practical discussions—many of our members being successful horticulturalists—the social feature and the educative parliamentary practice are among the features that make our society popular in this community.

REPORT OF THE WAUPACA COUNTY HORTICULTURAL SOCIETY.

W. H. HOLMES.

The Waupaca County Horticultural Society has its headquarters at the county seat, Waupaca City, though we often hold our meetings at the homes of our members. There are no local societies at present in the county. The county society was formerly the Waupaca Horticultural Society and Improvement Association. We have about one hundred names on the rolls of the present organization. One meeting was held January 27th, 1905 at which time a splendid talk was given by A. J. Philips of West Salem on Wisconsin seedling apples in general and Waupaca county seedling apples in particular. Other interesting talks were given by Mr. Barnes of Arctic nursery fame, Dr. Frost of Chicago and Rev. F. A. Hayward of Waupaca and Mr. Holmes paid a tribute to the late O. G. Secor the originator of the Secor strawberry.

Another splendid meeting was held at Mr. S. S. Chandler's October 10, 1905, the day Prof. Sandsten dug across sections of the experimental potato field showing the results of sprayed and unsprayed potatoes. It is needless to say the results were in favor of spraying, a bulletin of which is or will soon be issued telling the exact readings and results. Apples were also exhibited from orchards sprayed and not sprayed showing that the orchard should not be neglected any more than the potato patch. The results in more dollars to the orchardist as well as to the potato raiser should be an incentive to spraying.

At our meetings the wants of the "inner man" are never overlooked as the good suppers prepared by the lady members always attest.

The following officers were elected at a meeting held January 27, 1906 at the Park Hotel in Waupaca City.

President, W. H. Holmes.

1st vice president, Mrs. Hollis Gibson, Lind.

2nd vice president, Mrs. A. D. Barnes, Waupaca.

Secretary, Ray Barnes, Waupaca.

Delegate to the state meeting, Madison, Feb. 6, 7, 8, Mrs. A. D. Barnes, Waupaca.

REPORT OF THE LAKE GENEVA GARDENER'S AND
FOREMEN'S ASSOCIATION.

ALBERT H. REUPKE.

Mr. President, Ladies and Gentlemen: As the delegate from Lake Geneva, representing the Lake Geneva Gardener's and Foreman's Association, it gives me great pleasure to submit my report, herewith. Lake Geneva is well known on account of its many fine and large estates and the homes of wealthy people surrounding the lake from one end to the other. The gardeners on these country places, seeing that much was to be gained through the exchange of experiences and new ideas organized themselves into an association on March 4, 1905 with the following object in view—to increase the interest in gardening, to make exhibits of flowers and vegetables at seasonable times and furnish each other with reliable information pertaining to gardening.

At our first meeting the association had thirty two members and has since increased to forty-five. We meet on the first and third Saturday of each month and although some of the members live from five to six miles away, many of them make it a point to attend these meetings which are nearly all made profitable and enjoyable to the members by showing flowers, fruits and vegetables and the reading of papers especially prepared for the association. It is one of our rules that everything for exhibition at our meetings must be correctly labeled. During the season were shown the first sweet peas on June 17, var., Earliest of All and Lady Spenser, also *Campanula persicifolia*, *Hauchera sanguinea*, Peonies and Cos lettuce. On August 19th, there were on exhibition some splendid spikes of *Gladiolus princeps*. On September 16 and 23 were shown fine collections of dahlias of all types and on October 7th the first chrysanthemums were shown grown out of doors, var., Glory of Pacific, Polly Rose, Mrs. Whilden, Omega and the Queen as well as a fine collection of grapes, and on January 6 some fine bunches of green house grown sweet peas. These had been sown October 15th and were therefore in bloom about seventy-five days later.

The following papers were read and discussed at our meetings:

The Propagation and Growing of Exh. Chrysanthemum pot plants by John Sligh.

The Culture and Propagation of Carnations by Alex. Johnson.

The Forcing of the following Vegetables: Potatoes, Cauliflower, Peas, Snap-Beans, Spinach, Beets, Head Lettuce, Onions, Radish and Carrots.

The Growing of Strawberries in frames, both papers prepared by A. J. Smith.

A paper on Wild Flowers by William Longland.

The Cultivation of the Grape-vine out-of-doors by James Balsden.

The Cultivation of Melons under Glass by Henry Tollman.

Hardy Perennials by J. Higgins, Lincoln Park, Chicago.

The Growing of Chrysanthemums out-of-doors by Frank Kuhns.

The Peony by A. J. Smith.

Then we have each month a paper on Seasonable Fruits prepared by some member. At the Mid-Summer Fair of which you have probably heard and with which we are affiliated, we made a display of flowers and vegetables which exceeded the expectation of every visitor. The following is an item from the L. G. News: "It is enough to say of the floral and vegetable exhibit that it was one of the finest ever held at any agricultural fair. The floral collections arranged for greatest effect were certainly in the highest state of art and attracted the attention and evoked the admiration of every one. Our congratulations to our Lake Geneva gardeners for this greatest of Fair hits."

In November on the 3rd and 4th we gave a flower or rather a Chrysanthemum show which proved financially as well as socially a great success. The premiums awarded were blue, red and white ribbons and some cash premiums offered by some of the shore residents. These premiums and the knowledge that all exhibits would be judged according to points by a competent judge made the competition keen and brought forth the best efforts of the gardeners and so added greatly to the success of our show. We closed the flower show with a banquet for the members and their visitors. At our next

meeting it was decided to make the chrysanthemum show an annual event in our association and we have already prepared the schedule list for this year. We have arranged to distribute chrysanthemum cuttings among the school children of Lake Geneva and will offer suitable premiums for the best plants grown by them by next fall. From the aforesaid you will perceive we are busy people, but still we found time to visit several nurseries and green houses. Last summer we made two trips around the lake with our families visiting the estates of our fellow gardeners.

At our organization the following officers were elected:

President, A. J. Smith, gardener for J. J. Mitchel.

Vice President, Alex. Johnson, gardener for R. F. Crane.

Secretary, John Tiplady, gardener for H. H. Porter.

Treasurer, Frank Kuehne, gardener for O. W. Potter.

Delegate to Windsor Meeting, Albert Reupke.

We are proud of our Treasurer's report, which shows:

In receipts from March 4, 1905 to September 1st ..	\$148 50
In expenses from same date	68 25
	<hr/>
Leaving a balance of	\$80 25

Then we gave our flower show on February 1st 1906 and our	
treasury shows an income of	\$561 75
and an expenditure of	327 92
	<hr/>
Balance	\$233 83

\$150 of this was put aside as a reserve fund to furnish the premiums at our next flower show.

Last June we had the pleasure of joining the State Horticultural Society and in the name of our association I wish to thank the society for the courtesies shown us and to extend to all an invitation to our Mid-Summer Fair and Chrysanthemum Show, as well as to any of our regular meetings if you should be in the neighborhood.

REPORT OF DELEGATE TO ILLINOIS.

W. A. TOOLE.

Your delegate to the Illinois State Horticultural Society was well entertained and reports a very enjoyable time.

This being the fiftieth anniversary of the organization of the society, considerable time was spent in reminiscence of pioneer days and reviews of the development of different lines of horticulture and related subjects during the past fifty years. None of the original members of the society are now living, though there were a number present who wore the "pioneer member" badge.

To a young man of the present day the enormous strides in horticultural progress during the fifty years considered was a surprise when so many illustrations were furnished together. The florist trade, the apple and small fruit industry, and market gardening have grown to very large size, and knowledge of the best means to combat insect pests and plant diseases, also methods of transporting and preserving fruit have developed from almost nothing during this time.

Besides the strictly historical papers, time was found to present much other valuable information. Probably the most notable thought brought out in the strawberry discussion, was, that to the commercial grower it is much more profitable to let the other fellow do the testing of new varieties. Owing to the fact that the strawberry plant will not grow well if planted so that the crown is too low or too high the transplanting machine does not find favor among Illinois strawberry men.

Bitter rot of the apple has received much careful investigation by the Illinois Experiment Station. This disease is not so troublesome in Wisconsin as it is south of us, yet at times it may become serious. The first infection of the fruit comes from cankered limbs and from mummified fruits left hanging on the trees over winter. Secondary infection may follow from the first infected fruit. Prevention consists in removing cankered limbs and mummified fruits and repeated sprayings with a fungicide. Much more careful spraying seems to be done in the commercial orchards in Illinois than the writer has

heard of in Wisconsin. Dust spray was pronounced a failure when a fungicide was used and of very little use in combatting the codling moth.

A very pleasing feature of the meetings was the strong spirit of mutual helpfulness shown by both the horticultural society and the experiment station.

While this was very much an apple growers' convention, ornamental horticulture and market gardening also received attention. Though there was some discussion as to varieties of apples, most of the time devoted to apple talk was spent on spraying.

The fruit display was large and very interesting, but few Wisconsin varieties were represented and the coloring and size of these were not equal to good Wisconsin specimens of the same varieties, such as are shown upon our tables. Their manner of arranging plates in the exhibits of fruit was very satisfactory. All competing plates of one variety were arranged together instead of grouping all the plates of one exhibitor. The re-arranging was done by a committee immediately after the entry books were closed. This method of arrangement would not be practical where sweepstakes are offered.

It was decided to judge fruit at future meetings by the use of a score card, the one recommended by the Massachusetts Board of Agriculture being adopted for present use.

The question box was a decided success at this meeting; it was put in charge of a competent man who distributed paper and collected the questions each day and who also lead in the discussions. A question box seems desirable where well handled, otherwise it is a flat failure.

A banquet was held which was well attended and it proved a very enjoyable occasion, presenting as it did, another side of the generally versatile horticulturist.

Your delegate was rather amused sometimes at the remarks of some of the citizens of Central and Southern Illinois who seemed to believe Wisconsin and the north pole have much the same climate and consequently that there is but little chance for fruit growing in this state.

REPORT OF DELEGATE TO IOWA.

WILLIAM HANCHETT.

It was with a feeling of unalloyed pleasure that I received Secretary Crane's notice that I had been honored with the appointment as delegate to the Des Moines meeting to be held December 12th to 14th 1905, for I must confess to a longing to explore new fields and discover whether or not the horticulturist there belonged to the same class as Wisconsin people. I arrived at Des Moines early on the morning of December 12th and took my way to the appointed headquarters as a gathering throng of earnest looking men gave notice that the crowd had commenced to arrive, and that horticulturists were the same earnest, energetic men the world over.

The time allotted the several sessions was well filled and the discussions interesting and spirited.

The directors from the several districts reported all classes of fruit vines and trees were in excellent condition through the state.

The discussion on spraying brought out the fact that where ever thorough work had been done that the results had been very beneficial, numerous instances being cited where thorough work during the past unfavorable season had been rewarded with a handsome return on an orchard while neglect had given no return whatever.

From the discussion on fire blight I discovered that they have just as many theories in Iowa regarding it as we have in Wisconsin, but would not be willing to concede that they have any more.

The general complaint of the small fruit grower was low prices and small profits.

One gentleman found it profitable to can his strawberries when the price dropped below \$1.25 per 24 qt. case; he used for this work an outfit that he made himself at a cost of \$50.00, with which he could can 1,000 to 1,500 quarts a day.

I was very much pleased at the practical businesslike turn all discussions took. The discussion on cold storage brought out the estimate that could the orchardists of Iowa by proper

cold storage facilities and by raising suitable varieties, supply the urban population with winter apples it would make a saving to the state of \$1,500,000.00 per annum and estimating that the rural population consumed as much per capita the saving would be over \$5,000,000.00 per annum.

Would not some carefully gathered statistics of this kind be of value to our state. There were over 600 plates of fruit on exhibitin at the meeting. The banquet given at the Savery Wednesday evening was a very enjoyable affair, and this report would not be complete without a mention of it.

REPORT OF DELEGATE TO N. E. IOWA.

CHAS. L. PEARSON.

The N. E. Iowa Horticultural Society held its annual meeting in Hampton December 19-20 and 21st; W. H. Guilford presided and John C. Ferris was secretary.

The delegates were warmly recived and hospitably entertained. The local attendance at this meeting was light. The total attendance averaging about thirty-five for each session.

The papers read were short and to the point, up to date methods of fruit culture were advocated and the discussions were spirited and keen.

Hampton is a beautiful little city of three thousand people and no saloons in sight. The surrounding country is dotted with groves of trees and the substantial farm buildings denote prosperity. Considerable fruit is grown near Hampton, 500 bushels of strawberries were marketed by N. E. Ferris last season. They were of the Jones variety originated by himself. We heard of one resident who sold \$900 worth of wealthy apples from 100 trees. Another local fruit enthusiast had recently ordered \$4.125 worth of plum trees, he was not present at the meeting. We hardly think it worth while for the nurserymen here to go to Iowa hunting for like chances to sell trees.

Hampton is proud of its green-house and the owner Mr. Ed. Curtis, who has by strenuous endeavor climbed the rugged

pathway of success—takes pleasure in showing visitors the blooming beauties which thrive beneath 10,500 square feet of glass. There were about one hundred plates of apples exhibited at the meeting some of the best being “Patten’s Seedlings.”

In his paper on “The evolution of the apple” C. G. Patten said that in the process of cross pollenization he could control the color of the apple he wished to produce and could also control the form of the tree.

Prof. Beach told how the fruit grower could overcome some of his troubles by proper attention to spraying. He also gave an interesting demonstration on preparing the liquid Bordeaux mixture showing that each ingredient—the lime and the blue stone—should be dissolved and fully diluted before mixing together.

Elmer Reeves advocated the dust spray, claiming that it could be purchased ready for use, was easily applied and did the business.

In the discussion on trimming sec. Wesley Green of the state society said: “Don’t trim your orchards severely, don’t cut off large limbs, thin out the small limbs to let the sunlight in, and in a commercial orchard head the trees low.”

C. Berthelsen, delegate from Minnesota, said he had cut off all the limbs in an orchard of Hibernial and grafted in Wealthy with satisfactory results. Mr. Berthelsen said the favorite varieties of apples in his locality are—Duchess, Lowland Raspberry, Wealthy, Patten’s Greening and N. W. Greening.

Elmer Reeves gave the following as a list of fruit adapted to northern Iowa, Apples—Duchess, Wealthy, N. W. Greening, and Patten’s Greening. He also spoke highly of Windsor Chief and Brilliant.

Plums—Desoto and Wyant.

Cherries—Early Richmond and Montmorency.

Currants—Victoria and White grape.

Gooseberries—Howland and Downing.

Grapes—Concord, Worden and Moore’s Early.

Strawberries—Warfield, Dunlap and Crescent.

Raspberries—Turner, Cuthbert, Older and Kansas.

Blackberries—Snyder.

E. Blakeman of Decorah, Iowa said there were but few farms in his locality without apples, Wealthy and Patten’s

Greening are favorites, pears are a failure, peaches no good, strawberries yield heavily and prices range low.

Prof. Van Houghton of southern Iowa talked on cold storage. Apples should be cooled over night before being placed in cold storage. The Wealthy is exceptionally good for keeping in this way. Cave cellars were recommended for storing fruit. They should be covered with three or four feet of earth and air admitted by an underground pipe and should have a small air chimney at the top.

The president's address recommended that papers be assigned six months previous to the date of next meeting. The members voted to adopt this rule.

These officers were elected for the next year. President, C. G. Patten; Vice President, C. F. Gardner; Secretary, C. H. True; Treasurer, E. Blakeman.

The next meeting will be held in Charles City.

REPORT OF DELEGATE TO MINNESOTA.

E. P. SANDSTEN.

Through the kindness of this society I was appointed a delegate to the meeting of the Minnesota State Horticultural society. The meeting on the whole was both profitable and interesting. It was held in the First Unitarian Church and the facilities for handling the crowd and the exhibit was very good, but so far as the general attendance was concerned it was a disappointment. It was told by the secretary that the membership of the society is nearly 2000, while the attendance was not larger than is here today. Many of the old pioneers were present as usual, prominent among them Mr. Wyman, Mr. Elliott, Mr. O'Brien, Mr. Yankke, Mr. Latham, Mr. Loring, and our Mr. Phillips and Mr. Kellogg of Wisconsin.

The program was extended over three days and it was too full to permit of a full discussion of the various topics handled, and I think a mistake was made in trying to cover too much ground. One part of the program was given over to the nursery men and their customers. This part proved exceedingly interesting and brought out facts which the fruit growers in

general are not acquainted with, though the consensus of opinion was that the nurserymen and the fruit grower having the same object in view should be honest with one another. The promiscuous employment of agents was discussed as a menace to substantial progress. It seems that our society could profitably devote a half day to this subject in a future program.

The impression an outsider would gain from attending the Minnesota meeting would be that Minnesota horticulturists have gone apple mad, while Minnesota members may accuse us of going plum mad. Apple seedlings were the most absorbing topic and the exhibit showed evidence of great activity among fruit growers and farmers in the production of new seedlings. The exhibits were exceptionally large and fine, especially so was the collection of seedling apples. I think that the Minnesota people have stolen a march on us in having their meetings in December, as they can then make a better exhibit of fruit than we can in February. We can only exhibit fruit that has been kept in storage or a few of our winter apples. Whether any direct gain results from having the meeting in December instead of February is an open question but I think it worth while for us to consider.

There were two prominent apple seedlings exhibited. These two seedlings are now being propagated and distributed. There is also a seedling shown by Mr. Perkins of Goodhue County that stands very high and is now being extensively tested. This seedling is in line for the prize offered by the society for the best winter seedling.

The liberal prizes offered by the society for the production of apples and plums is beginning to bring results. Besides the prizes for apples there are two prizes for plums, one for \$1,000 and another for \$100.

Referring to the question of membership, I was impressed with the fact that while the membership in the Minnesota society is very large the attendance was relatively small and I firmly believe that the strength and usefulness of the society does not lie entirely in the number but in the enthusiasm and activity of the workers.

One criticism I would make on the meeting is the generality of the topics discussed and I heartily want to second our secretary's idea of the program, namely, that so far as possible

each paper presented at the meeting shall stand as a monogram or a thesis on that subject for a long time to come. It should, as far as possible, be a finished product printed for future reference. In this way only can permanent good be derived from the report and a history of horticulture in each state be recorded.

Another fact was brought back to me with greater force than ever, namely that while discussions in many instances are for the enlightenment of others, they are in other instances mere discussions of personal opinion which are hardly profitable since seldom two persons agree. Each speaker is insistent that he is right in his opinion—the fact is that we are all right according to our own opinion.

When we consider Minnesota's position on the map and her age as a settled state, I think that she has a right to be justly proud of her achievements. She will some day be able to teach her more favorite sister states the secret of profitable fruit growing.

The closing climax of the meeting was the banquet Thursday night, December 23rd. At this meeting a number of toasts were given, Mr. Phillips and Mr. Kellogg responding in their usual happy mood. Prof. Hansen of South Dakota gave a very interesting talk on Luther Burbank and his work. He dwelt at some length on the achievements of Mr. Burbank and upon the favorite soil and climatic conditions under which he is carrying on his labor. He was not able, however, to get from Mr. Burbank any direct pointers as to how he accomplished his marvelous results. Mr. Hansen's opinion was that Mr. Burbank's success was attributable to his intimate knowledge of plant individuals, his ability to judge the value of a seedling while in its infancy, and to the favorable soil and climatic conditions. The height of the discussion was engendered when the question was brought up of extending the list of the best apples for the state. The principal warriors were Professor Green and Mr. Wyman. On the whole, the meeting was one long to be remembered by those in attendance.

REPORT OF DELEGATE TO NORTHERN ILLINOIS.

MR. M. V. SPERBECK.

It was my good fortune to be appointed delegate to the the Northern Illinois Society, which was held December 7 to 8 at Harvard, Illinois. The convention was held in the Opera House, with a good attendance and much interest manifested. The members seemed to feel that they wanted to gain more knowledge along the line of work that they are engaged in. The display of fruit was good; the apples, such as Jonathan, Wealthy, Pewaukee, Grimes Golden, Ben Davis and such varieties as that they had fine specimens of, and a nice showing of pears, I think about six varieties. Their exhibit of canned fruit was nice, and a very fine show of seed corn, which was not on the list for premiums, but they made a fine exhibit, the finest I ever saw. Their vegetable show was not very extensive, but they had good specimens.

Senator Dunlap gave them an able address on Successes and Failures of Fruit Growing. Mr. Schermerhorn, of Southern Illinois, gave them an able paper on spraying, showing the benefits, the profits and losses in the proper care of an orchard. He spoke of one man who had sold his crop on the trees for \$1,200, that orchard had been properly cared for, and, the man gathered the apples and took 2,600 barrels of apples from the trees, so they grow quite a few apples down there. Another man I think was a Chicago man who had bought a farm and had not cared for his orchard, perhaps thought spraying did not pay, or had not the time, and he got this gentleman to go with him and estimate for him what he should ask for his apples, he wanted to sell on the trees also, and he said when he got within sight of the orchard he could not see a leaf on the trees, that he concluded there was something wrong, and he went through the orchard, examined it thoroughly, and he said he could not find five apples on a tree that would sell for a number 2; I guess the insects were doing better work down there than they are in Wisconsin. And the old fellow was very anxious as to what he should ask for his orchard, and he finally said, "If you can get \$25 for your crop, you had better sell."

And the man who bought gathered the apples and he was out \$40 on the purchase price, so that it seems to me it demonstrated fully the value of spraying, and I believe to-day that the question of spraying is the leading question among fruit growers. Mrs. Hey, of the Society, had an able paper on "Home Adornment," and Mr. Rankin of the State University, gave them an able talk on the American Farm Boy. The only objection I could find was that he did not tell us how to make a smart boy out of a lazy one. The last evening was given over to the young people, and there was music and recitations and a very enjoyable evening was had. The Society re-elected President Thompson, who I believe is the right man in the right place. I believe that he is the lever that has raised Northern Illinois Society to its present standard, and I look back to this meeting as one of the bright spots along life's pathway. Now, I hope that our State Society will extend the right hand of fellowship to the visiting members and delegates from other states and accord them such a hearty welcome that they will feel that there are worse wild animals to meet than the Wisconsin Badger.

REPORT OF 1905 MEETING OF AMERICAN POMOLOGICAL SOCIETY.

S. H. MARSHALL.

Mr. President and Members of the State Horticultural Society:

The Twenty-ninth Biennial meeting of the American Pomological Society was held at the Coates House, Kansas City, Sept. 19, 20, 21, 1905. The meeting was opened the 19th at 8 P. M., and immediately adjourned to the dining room where the Society was served a most elaborate banquet tendered them by the citizens of Kansas City. The speeches were good and some of them very witty. Kansas City is growing and thriving very fast. The city is built on a hill of stone where houses can be built with the rock excavated from the cellar. They have a most extensive and up to date trolley system and we were given a chance to see it and the city by a ride all over

its lines one beautiful afternoon. Any one interested can refer to the pictures on the President's desk which have been left there for your inspection.

The Society opened for business the morning of Sept. 20th when the mayor made an address of welcome which was ably responded to by Mr. Parker Earle, upon behalf of the Society. Mr. Watrous, of Des Moines, Iowa, was elected chairman as President Hale did not come. After listening to the reports of the secretary and treasurer of the various committees, Prof. Albert Dickens, of Kansas Agricultural College, read a paper "American Plum in Kansas." As the climatic conditions in this state differ so from ours, there was little in this paper of value to north-western growers. In the discussion which followed Mr. Munson, of Texas, claimed that most of the Americannos winter killed with them. Mr. Watrous, of Iowa, found it impossible to dispose of his crop this past summer. He did not agree with Mr. Munson, but claimed that the trees referred to had summer killed, not winter killed. This paper was followed by several that were of no practical value to Horticulturists in Wisconsin. C. H. Williamson, of Illinois, chairman of the committee on Grading and Inspecting Fruits said that his committee were not ready to recommend any rules as yet, as it was very difficult to formulate a set that would be applicable to all parts of the country. Mr. Joe A. Burton, of Orleans, Ind., read a most interesting paper upon cultivation of Orchards as practiced by him in raising apples that won him a silver medal at Paris and a golden medal at St. Louis. From 117 trees of Grimes Golden that produced him half a crop of fruit the year before he sold \$1,750 worth of fruit this season. He does not believe in clean cultivation in rich land when there is liable to be any wash, but cultivates twice a year, fertilizes and uses quack grass for a cover crop. Sprays thoroughly with liquid spray and finds it cheaper and better to put two men at the pump handle. In the discussion of the paper by Mr. Pollards, of Nebraska (On Spraying) the consensus of opinion was in favor of liquid spray, though the dust spray had its advocates. The first spray before the buds start was the most important and that too much care could not be used in the preparation of Bordeaux mixture. There was considerable difference of opinion as to the best arsenic.

Mr. Coburn uses a preparation of 4 oz. white arsenic and 4 oz. sal soda, boiled 15 minutes and then add 4 lbs. lime. This quantity to each bbl. of water. Mr. Williamson who buys annually from five to ten thousand dollars worth thinks there is nothing so good as arsenite of lead. Parker Earle and others recommended Disparine very highly. It might be well to mention that the only enemy apple orchardists have to fight against as yet in the western states is the coddling moth.

Mr. W. D. Colburn, of Colorado, read a very interesting and novel paper on top grafting, using a saw instead of a chisel to make the cleft. He claims he does not loose one scion in a thousand and can graft a six inch branch as easily as a small twig. Saw a notch in the limb after sawing off the part above where you wish to insert your scion, use a half moon harness knife to smooth off the cleft. Cut the scions about two inches and after beveling it on one side hammer it into the cleft. Leave all branches below and do not cut them or the water sprouts away until the following year. Wrap plum or cherry trees to keep the bark from turning back. Wax the same as other grafts. This manner of grafting has been successful on 160 varieties of trees in the past ten years. The advantages claimed for it are that it is more successful, easier and faster than any other method.

Prof. Hansen, of South Dakota, then gave an interesting talk on Breeding Strawberries and Raspberries for the Northwest, but brought out no points that we are not familiar with.

Wednesday evening was devoted to short papers upon fruit growing, historically considered in some of the states west of the Missouri. While this was an entertaining session the conditions of that country are so different from ours they would be of no practical benefit to this Society.

We opened Thursday morning by electing Mr. L. A. Goodman, of Kansas City, President; Prof. L. V. Munson, of Texas, Vice President; John Craig, Secretary, and Prof. L. R. Taft, of Michigan, Treasurer. The balance of the morning was devoted to the benefits to fruit growers, and lessons learned at the St. Louis Fair.

The most interesting papers were given at the afternoon session by Mr. Bassett, of Michigan, and Dr. H. H. Whetzel, of Cornell, both of whom you will have the pleasure of hearing at our present meeting. The principal paper of the evening was

presented by C. L. Watrous, of Iowa, and was a very interesting talk on Japanese Horticulture as observed by Mr. Watrous and presented by him in his usual happy manner. This finished the program and we all felt fully repaid for our journey and with a renewed interest in the work we were trying to accomplish. It is not only the set talks that make these meetings so valuable but the meeting and discussing with the men in attendance. It is there you come in contact with the most prominent men in Horticulture from all over the United States. Who could help being benefited after spending two or three days with such men as Jno. Craig, of New York, Mr. Goodman, of Kansas City, Parker Earle and Prof. Fabian Gracia, of New Mexico, Prof. Beach, of Iowa, Col. Brackett, of Washington, Prof. Emerson, of Nebraska Agricultural College, Prof. Munson and Col. Kirkpatrick, of Texas, and C. L. Watrous and Mr. Patten, of Iowa, and dozens of others from thirty or more different states. I sincerely hope that at the next meeting that this Society will not send one delegate, but that they can afford to send four or six from various parts of the state. These men I speak of must be enthusiastic workers or they would not have arrived to the prominent positions in Horticulture that they now hold and you come away with a part of their enthusiasm.

The exhibit of fruit was fine and especially interesting was a display of Missouri, showing apples grown in 1903, 1904 and 1905, one of some thirty or forty plates of seedlings grown by our old friend Mr. Patten, of Iowa, and 123 varieties of peas grown on the grounds of Ellwanger and Barry. All of these exhibits were awarded Wilder medals.

On Thursday evening, September 21st, after procuring a berth in one of the two special Pullman's and a health certificate properly signed by the City Physician and Sanitary Superintendent stating that I had not been in the states of Mississippi or Louisiana I started on one of the most enjoyable excursions ever participated in by a body of Horticulturists. This excursion was tendered by the Kansas City & Southern and St. Louis and San Francisco Ry. Co.'s through the efforts of Mr. Goodman and his brother members of the Missouri State Horticultural Society, and others. From beginning to end it was most enjoyable and instructive and nothing was forgotten that would add to the comfort of any member of the party. Enough

cannot be said of the courtesy, thoughtfulness and efficiency of Mr. Goodman and his aids, and the railroad companies and their employes, the citizens of the various towns where we stopped or of the Horticulturists and farmers who lived near these various places. If we had been President and his Cabinet we could not have had better care nor greater ovations than we received along our line of travel. It took some time and trouble to get 73 of us provided with berths in the two Pullmans, but it was finally accomplished and we all retired in good spirits and full of expectations. We awoke next morning in the fruit country and had breakfast furnished us by the citizens of Neosho. After breakfast we were all given a drive out to the fish hatchery and hurried back to our train, which being a special did not leave until all were aboard. A short time after we had started Mr. Goodman (who was in our car) got up and said that we were now entering his orchard and would be going through it for the next ten miles. Here is food for thought for a man from Wisconsin with a ten-acre orchard on a sixty-acre farm. This orchard was only partially planted, some 2,500 acres mostly apples, but some peaches. The apples were not all Ben Davis, but of a number of varieties, Jonathan, Gano, Tompkins County, King, Grimes Golden, Pearmain, Wine Sap, Maidens Blush, Ingrain, Gravenstein and others. The soil is red and filled with stones (that is the best fruit soil) so that you could not use a disk on it. This soil seems in most places to be many feet deep. Cultivating an orchard here seems to mean plowing it up in the fall. Parts of Mr. Goodman's orchard was under cultivation and parts of it were grown to grass. There seems to be a wide difference as to the benefits of cultivation down here as there is with us. Many an argument was heard on the cars on this same subject, and I must admit that those against cultivation seem to have had the best of it, judging by the various orchards we saw through the Ozarks on our five day trip, and no good example of either a cultivated or uncultivated orchard was allowed to pass without the champions of that method calling the other side's attention to it. This is explained, I think, by their having such a very wet season there and the land most of it being very high and rolling. The sod land ran a great deal of the water off that the plowed land absorbed. Our next stop was at Gentry, where

we arrived about eleven. Here all the town turned out with a brass band to meet us. Twenty or thirty carriages, all the school children dressed in white to sing for us, and flags flying, everything in the true Southern hospitable style. We were driven through orchards and orchards and then brought back to town and had a dinner in the open square, and such a dinner. Fried chickens by the hundreds and such fried chicken, beaten biscuits, more than a dozen kinds of preserves, sweet and white potatoes in every style, beef, vegetables, pies, ice cream, cakes and a welcome, and you were forced to eat three meals in one because you could not help yourselves. This was repeated at all the other stops:

After our dinner we adjourned to the town hall and exchanged speeches for half an hour and then all aboard for Silvain Springs. We reached this pretty little city about five o'clock, and were driven to the springs and from there to the hotel to supper. About eight o'clock we gathered at the Opera House and had some more speeches, and a good audience. Two things surprised me here, and at several other towns we stopped at, the entire absence of negroes and saloons. A gentleman told me that some years ago when they had both, it took eight men armed with rifles and revolvers to keep order, and that now one man did the work, and they seldom had a prisoner in the lock up. We left Silvain Springs that night and breakfasted the next morning at seven at Horatio, the most southern stop on our trip. This place is about twenty miles from Texas and forty from Louisiana. After breakfast we were driven out to see a three thousand acre orchard all planted to the Alberta peach. This orchard is owned by a syndicate, and has been planted three years. The company cultivates on each side of the trees and the balance of the land, between the rows, is let out to farmers. They being given the use of the land, but must raise some crop that requires cultivation and in most cases cotton is the crop. This land stands the company about \$50 an acre with the trees ready to bear. Nearly all of it has been sold in small parcels at \$1.00 an acre. Under this arrangement the company has a very safe investment. From here we went north to McQueen where the train was held until we had dinner. We then continued on our way and had a most beautiful ride through the Ozarks. The country reminds one of Northern Wisconsin except that it is more hilly and the

timber is heavier. You see a small saw mill occasionally and the towns have a familiar look. The cities are well built, look new and thriving, with all the modern conveniences and you find wherever you stop northern people. The best of this timber land is worth from \$8 to \$10 an acre, and when cleared some of it makes good fruit land while that in the valleys will make fair farming land. In talking with a farmer from Jefferson County he told me his land would produce about the same as his old farm at home, and that he could increase his bank account quite a little each year on what he saved in fuel, clothes and feed for his stock. We arrived at Mena about supper time and some of us drove and others strolled about the city. This is a very pretty city of some 5,000 people, seven years old, surrounded by rough but charming country, and the air is clear and pure. No young man could make a mistake in starting here in almost any line of business. We had our usual speeches and then took our train again for Ft. Smith, where we arrived at 5:10 A. M. and spent the day, it being Sunday.

Ft. Smith is quite a place, being a city of some 30,000 inhabitants, with a very good hotel. We had no stated program for this day except a trolley ride in the afternoon out to a nice park of 100 acres or more, owned by the City Railway Company. They have a very nice club house at the Park, also owned by them, and they furnish free concerts and vaudeville shows for the general public. This is Southern enterprise. We spent the day (and it was a hot one) going to church, bathing and resting.

The party left Ft. Smith some time that night and arrived at Fayetteville in time for an early breakfast. After breakfast we spent several very pleasant hours going through the State University which is located here. We went from here to Rogers and then to Bentonville where we had another dinner and saw more orchards and had another pleasant drive and more speech making. From Bentonville we went back to Rogers, put in several hours there and then went on to Springfield, arriving there at night, and leaving shortly after. We got to Thayer at 6:10, and while waiting for breakfast the railroad people hauled us down to Mammoth Springs, a few miles below and across the state line. This is said to be the largest spring in the world and feeds quite a lake besides running two

good-sized mills. You can see the spring bubble up in the center of the lake and it will turn a boat over it is so strong. The few fish caught in this lake have no eyes and resemble the fish caught in Mammoth Cave, Kentucky. After a good breakfast at Thayer we went on to West Plains, stopping for a few moments at a large vineyard where we were shown a good display of apples and other fruit and given all the red and white wine we cared for. At West Plains we were given a long ride through the orchards, saw them packing apples in the best cared for orchard we saw on the trip. These apples were all sorted into three classes, the best were packed in bushel boxes, and the other two sizes into barrels. This orchard was sprayed with dry spray fertilized and the grass kept down by being mowed with a bar mower and the grass allowed to dry and rot on the land. It was a very clean and thrifty looking orchard. From West Plains we went to Mountain Grove, but made a stop on the way to see some small peach orchards, 40 to 20 acres each. The owners of these orchards had all made money, and the orchards looked as though they should make money for their respective owners. At Mountain Grove we drove out to the Missouri Horticultural Experiment Station. This is a large farm with fine buildings, devoted to the improvement of fruit and supported by the state. They are experimenting with new varieties, breeding new fruits, and trying different ways of culture, etc. We then drove back to town and participated in another of those delightful and long to be remembered out of door meals and speech making. This ended our trip and we left Mountain Grove that night and arrived in Kansas City the next morning.

Unfortunately they did not have a crop of either apples or peaches in the Ozarks this season, and we missed seeing the fruit in large quantities. As to the orchards, many of the smaller and some of the larger ones looked thrifty and well cared for. Again, a number of the big orchards and some of the smaller ones showed lack of care and the trees looked unhealthy. This was owing to the very wet and unfavorable season, and it is a question as to whether the big orchards are going to be successful or not. They may be divided up and sold in small pieces at an advanced price to the small farmer. That they will make big money for their owners, I have no

doubt. But it is my opinion it will be in the rise of the land, and not from the fruit they produce and market. We hear so much in our state against railway corporations that I would like to tell you how we were treated, and pay a slight tribute to the railroads who entertained us. They did everything in their power to make our trip successful; would stop the train whenever we asked it, sent with us a passenger agent and the head of their Horticultural Department. This department disseminated Horticultural knowledge to any prospective buyer. Have a sort of farmers' institute corps who preach up to date methods of farming along their line of road, and during the season act as agents to sell produce in Kansas City for their patrons, without charge. They seem anxious to help settle the country and take care of the people after it is settled, instead of wanting all the land themselves and robbing the public after they get them there as we are led to believe in these days.

I cannot close without again referring to the hospitality and interest the people of Kansas City, Missouri and Arkansas showed to the American Pomological Society. The ability and care shown by Mr. Goodman, Prof. Craig and others in conducting the trip, and the good fellowship, courtesy and consideration of the whole party during the entire trip, and to hope that you may all have the pleasure of seeing the Ozarks, the home of the Great Red Apple and the Alberta peach under as favorable auspices. Respectfully submitted.

PREMIUM LIST.

Winter Meeting, Madison, Feb. 6-8, 1906.

1. Best Collection of Apples, not less than 10
and not more than 25 varieties (3d Prem.
\$3.00) \$10 00 \$5 00
2. Best 4 Varieties Winter Apples for market;
quality, hardiness, productiveness and keep-
ing qualities to be considered..... 3 00 2 00

3. Best 3 Varieties Winter Apples for family use; qualifications as above.....	2 00	1 00
5. Best New Apple named and in bearing at least 5 years, but not on society fruit list....	5 00	2 50
Best Seedling Apple.....	3 00	2 00
Best Plate Ben Davis.....	1 00	50
Best Plate Dominion.....	1 00	50
Best Plate Fameuse.....	1 00	50
Best Plate Golden Russett.....	1 00	50
Best Plate Longfield.....	1 00	50
Best Plate McMahan.....	1 00	50
Best Plate McIntosh.....	1 00	50
Best Plate Milwaukee.....	1 00	50
Best Plate Malinda.....	1 00	50
Best Plate Minkler.....	1 00	50
Best Plate Newell.....	1 00	50
Best Plate Northwestern Greening.....	2 00	1 00
Best Plate Perry Russett.....	1 00	50
Best Plate Pewaukee.....	1 00	50
Best Plate Salome.....	1 00	50
Best Plate Scott Winter.....	1 00	50
Best Plate Tolman.....	1 00	50
Best Plate Utter.....	1 00	50
Best Plate Walbridge.....	1 00	50
Best Plate Wagner.....	1 00	50
Best Plate Wealthy.....	2 00	1 00
Best Plate Windsor.....	1 00	50
Best Plate Wolf River.....	1 00	50
Best Plate Seek-No-Further.....	1 00	50
Best Plate Twenty Ounce.....	1 00	50
Best Plate Willow Twig.....	1 00	50
Best Peck Northwestern Greening, Fruit awarded Premiums to become property of the Society	3 00	2 00
Best Peck Wealthy as above.....	3 00	2 00

LIST OF AWARDS—WINTER MEETING.

Collection of apples, not less than 10, and more than 25 varieties: First, A. N. Kelley; second, H. Simon; third, D. E. Bingham.

Best 4 varieties, winter apples for market, quality, hardiness, productiveness and keeping qualities to be considered: First, A. N. Kelley; second, H. Simon.

Three varieties, winter apples for family use: First, H. Simon; second, A. N. Kelley.

New apple named and in bearing at least five years, but not on society fruit list: First, H. Simon; second, A. D. Brown.

Seedling—First, C. A. Hatch; second, A. N. Kelley.

Ben Davis—First, A. N. Kelley; second, H. Simon.

Fameuse—First, H. Simon; second, C. A. Hatch.

Golden Russett—First, C. A. Hatch; second, H. Simon.

Longfield—First, L. H. Palmer; second, A. D. Brown.

McMahan—First, D. E. Bingham; second, A. N. Kelley.

McIntosh—First, D. E. Bingham.

Malinda—First, A. N. Kelley.

Newell—First, C. A. Hatch; second, A. D. Brown.

N. W. Greening—First, Wm. Toole; second, A. N. Kelley.

Perry Russett—First, Wm. Toole; W. A. Toole.

Pewaukee—First, A. N. Kelley; D. E. Bingham.

Salome—First, H. Simon; second, Geo. J. Jeffrey.

Scott's Winter—First, O. J. Burnham; second, Wm. Toole.

Tolman Sweet—First, H. Simon; second, A. N. Kelley.

Walbridge—First, H. Simon; second, A. N. Kelley.

Wealthy—First, L. H. Palmer; second, Wm. Toole.

Windsor Chief—First, O. J. Burnham; second, D. E. Bingham.

Wolf River—First, L. H. Palmer; second, A. N. Kelley.

Seek-No-Further—First, W. A. Toole; second, Wm. Toole.

Willow Twig—First, H. Simon.

Peck N. W. Greening—First, A. N. Kelley; second, Wm. Toole.

Special premiums were awarded as follows:

Dr. T. E. Loope, display of Wealthy, \$2.00; W. E. Fitch, display of cranberries, \$1.00.

M. V. SPERBECK,

J. J. MENN,

Committee on Awards.

TRANSACTIONS—WINTER MEETING.

ELECTION OF OFFICERS, (TUESDAY AFTERNOON).

The following were appointed by the president as a nominating committee to bring in nominees for members of the Executive Committee: Messrs. S. H. Marshall, F. K. Edwards and Joseph Treleven.

An informal ballot for the office of president was taken, which resulted as follows: Total number of votes, 43; Dr. Loope, 33; Mr. Toole, 4; Mr. Irving Smith, 2; Geo. J. Kellogg, 3; Mr. Edwards, 1.

On motion, the informal ballot was made formal, and Dr. Loope was declared unanimously elected.

Mr. S. H. Marshall placed in nomination Mr. R. J. Coe for Vice President, and on motion of Mr. Hanchett, the Secretary was instructed to cast the ballot for Mr. Coe.

The election of Treasurer being next in order, the Secretary was instructed to cast the ballot of the Society for the present incumbent, Mr. L. G. Kellogg.

A recess of five minutes was taken, after which the nominating committee submitted the following report:

MEMBERS OF EXECUTIVE COMMITTEE.

First district—Alex. Johnson, Lake Geneva (credentials).

Second district—S. H. Marshall, Madison (credentials).

Third district—Wm. Toole, Baraboo.

Fourth district—F. W. Harland, Milwaukee.

Fifth district—Henry Melcher, Oconomowoc.

Sixth district—L. A. Carpenter, Fond du Lac.

Seventh district—J. J. Menn, Norwalk.

Eighth district—W. P. Bussey, Omro.

Ninth district—Irving Smith, Green Bay.

Tenth district—R. B. Johns, Wausau.

Eleventh district—C. L. Richardson, Chippewa Falls.

After some discussion, the report of the nominating committee was adopted as read.

The president announced the appointment of the following committees:

TRIAL ORCHARD COMMITTEE.

R. J. Coe, term expires 1909.

D. E. Bingham, term expires, 1908.

W. J. Moyle, term expires 1907.

FINANCE COMMITTEE.

Irving Smith.

M. V. Sperbeck.

J. J. Menn.

Committee on Fruit Judging: Messrs. Sperbeck and Menn.

Committee on Final Resolutions: Messrs. William Toole, Moyle and Converse.

REPORT OF COMMITTEE ON FINAL RESOLUTIONS.

Resolved, That the thanks of the Wisconsin State Horticultural Society are extended to the Superintendent of Public Property and his assistants for courtesies extended to this Society.

Adopted.

Resolved, That the Secretary be instructed to confer with the Attorney General relative to securing the enactment of legislation designed to protect buyers of nursery stock and nurserymen from fraudulent practices of certain nursery firms and agents.

Adopted.

Resolved, That article III of the constitution be repealed and that the following be adopted as article III: Its members shall consist of annual members paying an annual fee of one dollar excepting that paid members of local societies may become members on payment of an annual fee of fifty cents, of life members paying a fee of five dollars. Wives of such members shall be entitled to the privileges of full membership: of honorary annual members who may by vote be invited to participate in the proceedings of the Society and honorary life members who shall be distinguished for merit in horticulture and kindred sciences or who shall confer any particular benefit to the Society.

Adopted.

Resolved, That we approve of and confirm the action of the Secretary of our Society during the past year in former practice of securing members from local societies on payment of an annual fee of fifty cents.

Adopted.

A resolution involving an amendment to Article V of the Constitution was by vote referred to the Executive Committee, action to be reported at Summer meeting.

FINANCIAL REPORT OF F. CRANEFIELD, SECRETARY.

RECEIPTS.

Membership fees	\$268 00
W. P. Ass'n, refund	11 00
D. E. Bingham, refund	3 50
W. A. Toole, refund	45
F. B. Drake, books	4 31
A. P. Wilkins, books	3 05
Order No. 276	300 00
Order No. 360	184 00
Order No. 372	200 00
Order No. 378	47 47
Order No. 448	31 04
Order No. 452	200 00
Received on 12 salary checks.....	1,200 00
Ed. Gensmann, fruit	12 18
Gilman and Rick, fruit	100 00
Total	<u>\$2,565 03</u>

CREDITS.

Credit by payments to L. G. Kellogg, treasurer.....	\$343 99
Credit by salary	1,200 00
Mar. 28. Credit by expense accounts allowed.....	82 80
June 3. Credit by expense accounts allowed.....	89 50
June 3. Credit by expense accounts allowed.....	311 69
Aug. 4. Credit by expense accounts allowed.....	47 47
Aug. 28. Credit by expense accounts allowed.....	51 07
Oct. 6. Credit by expense accounts allowed.....	231 04
Dec. 2. Credit by expense accounts allowed.....	52 83
Feb. 6. Credit by expense accounts allowed.....	63 10
Feb. 6. Paid to L. G. Kellogg, treasurer, to balance.....	91 54
Total	<u>\$2,565 03</u>

REPORT OF TREASURER.

Wisconsin State Horticultural Society, in account with L. G. Kellogg, treasurer:

RECEIPTS.

1905.		
Feb. 10.	To cash from state treasurer	\$2,000 00
Feb. 15.	To cash, F. Craneffeld, memberships...	67 50
Feb. 21.	To cash, F. Craneffeld, memberships...	16 00
Feb. 21.	To cash, Western Passenger Ass'n	11 00
Apr. 11.	To cash, memberships	10 00
June 7.	To cash, memberships	26 00
Aug. 5.	To cash, memberships	30 00
Aug. 5.	To cash, sale of fruit, Wausau orchard	12 18
July 10.	To cash, from state treasurer	4,000 00
Oct. 13.	To cash, sale of fruit, Wausau orchard	100 00
Oct. 13.	To cash, F. Craneffeld, memberships...	36 00
Oct. 13.	To cash, W. A. Toole, refund express..	45
Mar. 14.	To cash, D. E. Bingham, refund	3 50
Mar. 14.	To cash, F. Craneffeld, memberships...	5 00
Dec. 4.	To cash, F. Craneffeld, memberships...	22 00
Dec. 4.	To cash, F. Craneffeld, books sold	4 34
1906.		
Feb. 6.	To cash, F. Craneffeld, memberships...	50 00
Feb. 6.	To cash, F. Craneffeld, cash returned..	45 56
		<hr/> \$6,439 53

DISBURSEMENTS.

By orders paid (Nos. 241 to 493, Inc.).			\$6,012 17
Feb. 6.	By balance due Society	427 36	
		<hr/>	\$6,439 53
		<hr/>	<hr/>

REPORT OF FINANCE COMMITTEE.

To the President and members of the State Horticultural Society: We are pleased to report that we have gone over the books of the Secretary and Treasurer of this Society and find all accounts in good form and correct. The last two vouchers Nos. 491 and 492 have not yet been returned.

IRVING C. SMITH,

R. J. ROE,

Finance Committee.

Miscellaneous Papers.

THE SUCCESSES AND DEFEATS OF HORTICULTURE.

DR. T. E. LOOPE, Eureka, Wis.

(Address at Annual Meeting of the Northern Illinois Horticultural Society, Princeton, Ill., Dec. 7th, 1904.)

This subject admits a wide field for speculation, as utter defeat to some natures would only serve as an incentive to greater effort to others, while a success to some might be deplored by others.

The terms defeat or success are but relative terms, varying according to the side lights turned on by different opinions or by those having different characteristics. The conceptions of Paradise differ in degree in the minds of the Indian, Chinaman, Esquimaux, African or the good old shouting Methodist. The Mormon attains highest glory in heaven by the number of wives he possesses, the Indian by the number of scalp locks, the Chinaman by intercession of his Joss, the Methodist by faith and fervent prayer.

The Indian's God is pictured in his imagination as a great chief decorated with a head dress of feathers and plenty of wampum. The Chinaman's God a terrific image cross-legged on a pedestal. The Methodist God a refulgent figure seated on a golden throne in that city whose streets are paved with gold and where angels forever twang their harps in unison with songs of praise and adoration. The infidel's God—well, he is not quite sure he has one.

So it is according to the preconceived idea of individual organism that we judge, each for himself of conditions or facts.

The scientist tells you that grass grows by certain additions of cells and molecules, but the ordinary farmer says it grows

because it rains and the sun shines. None can answer the simple question of the child, who says:

What makes the grass grow, sister?
What makes the flowers bloom?
Who makes the golden sunbeam
To dance around the room?
Who made our God in Heaven,
And how did He get there?
Did He have wings like angels,
Or did He climb a stair?

The horticulturist is constantly asking questions as hard to answer as this child's. With patient, untiring persistence he is endeavoring to pry into Nature's secret workings. He carefully notes the effect of changing seasons on his crops. Fungous diseases are traced step by step and the proper remedies sought for. Insect enemies are studied and the best insecticides are made the subject of careful examination. The matter of hybridization is taken up and carried forward patiently for years, and yet after getting results many things remain unanswered.

If, after all his searching, he falters or grows weary of his quest, he suffers his greatest defeat. His material defeats come from lack of sun or rain; from surplus of moisture or withering sun; from ravages of insect pests; from lack of suitable tillage. His supreme defeat comes from lack of enthusiasm—the first, financial; the last, spiritual; without which he is like a mariner without a compass.

The horticulturist is one whose paternal ancestors were sun worshippers.. His maternal ancestors may have been saved from the flood—one to whom the rain god was propitious. He is a distant relative of the man who served seven years for a wife, and failing of that maiden, grubbed along seven more for the sister. He was bound to be in the family. He is kin to Nebuchadnezzar—couldn't bear grass in his sight. He received the command in good faith, "By the sweat of thy brow," etc. He is the man referred to in the quotation, "By their fruits ye shall know them." He was one of the original gleaners, but they made a mistake and put skirts on him. He is no relation to those "Lilies of the field who toil not." He has no fellowship with that fellow who said, "A little more sleep," etc. A promi-

nent man in Wisconsin came near giving his status when he spoke of "God's patient poor"—but he said that for votes, and got them, too. If he broke into the legislature in Wisconsin he would introduce a bill for weed wardens in place of game wardens, only not so many and they would work cheaper.

His successes come through the enthusiasm he gives his work. A new variety of fruit is better than a bank account. A record breaking crop is a red letter event more precious than to be elected President. He figures his profits with a pencil and paper before his plants blossom. When the frost kills half the bloom he revises his former estimate and leaves a comfortable balance. The drought, blight or leaf roller cuts the last revision in two, and he still has a hope that somehow everything will be all right. The commission man takes the remainder, but still his spirit is undaunted with the prospect of a boomer next year. Therein lies the secret of his perennial cheerfulness. I don't know a horticulturist who wears a long face.

Neurasthenia is unknown in their ranks. His deportment may be quiet, but touch on his pet subject and his face lights up like an arc light that throws no dark shadows. He never gets wrinkled like other men. He always has a new apple or berry that is the coming fruit, with coupons attached. His speckled apple has quality, hardness and is a great cropper. His striped strawberry melts in your mouth and in size compares favorably with a football. A drouth improves the shipping quality of his berries. Excessive rains produce pedigree plants. I vouch for the truth of all these assertions, because I have heard him tell it. A cyclone is only a slight break in the thread of his anticipations. He is never a bad man, for he has no time. He may be illiterate, but he is not ignorant.

I have written of the horticulturist; of the man, rather than the subject. I know very little of horticulture, but a whole lot of the horticulturist. I have been associated with him in business and in pleasure. I have seen a great many of him in societies, and I know that he is the greatest enthusiast, the dreamiest dreamer, the most profound thinker, the greater master of detail in his line of business, the most careful investigator of Nature and her secrets, the entertaining talker, the biggest bore, the easiest to swallow bait, hook and line, the hardest to convince of error, the most modest, the one who is "Johnny on the spot" when he ought to "go way back and sit down," and the

nerve destroying high pitched droner who will talk all night about nothing to the destruction of sleep in the hotel he stops at. But as a whole, he is the salt of the earth.

He will tell you that a piece of zinc and copper hung in a tree will protect a tender tree from winter killing. That a little salt under a tree will make it prolific. That a layer of sand will do more than mulching or manure. That good stiff blue grass sod is the ideal condition for the orchard. That you should chop a tree to pieces to make it bear, and again that you should never prune a tree. He will talk at length about blasting holes to plant trees in. He believes in signs, but I never saw one who wore a rabbit's foot.

As a whole, he is a good, law-abiding citizen, a close observer, an honest, upright, capable man, inclined politically to prohibition, and a friendly, hospitable, all round good fellow. He labors and investigates for the good of his fellow man. He seems old while yet young and is youthful when the frosts of age have silvered his hair. He is indigenous to all ages and countries. He commenced his career in the Garden of Eden in the apple business. The millenium will find him at the climax of his glory, testing the latest seedling.

He will tell you that the common wild crab root is the best stock for grafting. That the Russian apple tree is the only successful tree. He will argue that the whole root is the whole thing, or that piece root will insure growth on its own roots. He will contend that the strawberry should be planted with a dibble, or that a machine must stab them into the ground. He is forever laboring to produce something more palatable and delicious, more useful and healthful than anything that has gone before. His field is the whole earth, his patrons the whole human family.

The defeats of horticulture may be multitudinous, but they are never paraded for the herd to comment on. No horticulturist ever tells of his luck when he tries to sandbag Nature. There is no glory in the tale. That man carries a purse with a black eye, instead of one filled with collaterals and greenbacks. His bank account has anemia. No man but a reformed drunkard temperance lecturer can tell the public what mean, low-lived things he has done. The average horticulturist is not financially a Rockefeller, but in integrity, intelligence and humanity he may rank higher than a standard oil magnate. Faith, hope and

charity are his peculiar virtues, but charity he reserves for his fellow man, and puts his faith and hope in active commission horticulturally. Many times his only assets are hope and faith. How poor is he who cannot reckon these in his yearly balance!

Like the "Specter that lifts the coffin lid of Hope and Joy and Love, and bending mournfully above the pale, sweet forms that slumber there, scatters dead flowers o'er what has passed to nothingness," the horticulturist leaves the defeats to their oblivion, and arising girds himself for the fray with a new hope that springs eternal and the faith that never fails, confident that success only waits for him that fainteth not in earnest endeavor.

Have you never thought of the grand benefits of your profession to mankind? Do you realize the importance of the results of your work to all the people of the earth? Did you ever try to estimate the magnitude of its beneficent influence? All the millions of humankind are eager for the products of your toil. The health and happiness of the world is involved in the success of your efforts.

Animated, then, by supreme hope and ardent faith, let us press forward and faint not, fail not, weary not, in our mission.

FROM MADISON DEMOCRAT, FEB. 9TH, 1906.

The work of the annual convention of the Wisconsin State Horticultural Society came to a close practically last evening with a banquet at Keeley's hall. More than 70 people partook of the sumptuous menu worthy of the yeomen of the soil who tickle mother earth until she yields bountifully of her best products for the benefit of all. Throughout the banquet and during the program Bach's mandolin and guitar orchestra added to the enjoyment and promoted the flow of soul after the feast. As toastmaster, Dr. T. E. Loope, president of the society, was particularly happy in his opening remarks as he introduced C. L. Richardson, U. W., '06, the only member of the society who appeared on the program. He had for his topic, The Creed of the Horticulturist, and extended a cordial welcome to the fruit growers from other states. He spoke of the benefits received by the members of the society who had attended the three

days' session. Grafting had been discovered in the society as well as in university athletics and the organization had perhaps become in one sense of the word "grafters." Many are the pleasures of the horticulturists as they fight the insects and plant diseases in the early hour of the morning. Unlike Diogenes of old he does not look for honest men but rather seeks the curculio and other destructive agents that rob the fruitgrower and deplete his pocketbook. The horticulturist has succeeded in making two spears of quack grass flourish where only one grew before. Plant growth has been retarded by the importation of the strawberry leaf roller and other foliage blemishes. Ever stirred up by the hope of a full crop despite the loss by frost, storm and insect ravages, the horticulturist struggles on, ever looking on the bright side, confident that some day, sometime, a good crop with high prices will crown his efforts. To lighten his labor he calls to his aid the latest discoveries of science, plants his apple trees with dynamite and utilizes all things possible in the warfare with stubborn nature.

From Michigan came George W. Rowe, a witty speaker, who was introduced by Toastmaster Loope as a man from that sandy country, who had the address of a dancing master, the air of a preacher and the nerve of a fruit tree agent. Mr. Rowe is a fruit grower on a large scale in the wolverine state near Grand Rapids. With anecdote and story aptly told, he was soon en rapport with his audience. The history of the origination of the seedless apple and its development into the tree which bore apples and sausage was particularly enjoyable.

The topic assigned Mr. Rowe, "Some Things I Have Seen and Others I Have Heard About," gave him ample latitude to illustrate the sham of the seedless apple which he laid bare in a way that convulsed the audience.

Praying or (s)praying is useless unless done in earnest, said S. A. Beach, professor of horticulture at the Iowa Agricultural college at Ames. He had for his topic, "Seeds," followed by the thought "Let us (s)pray." He brought with him the greetings of the hawkeye society and incidentally told of the merits of Iowa corn which had taller stalks, larger ears, more of them, and to cap the climax, each stalk was hollow from butt to tip and full of shelled corn. Professor Beach told of the corn gospel which is being preached thoroughly to the people of Iowa through the efforts of the agricultural college with its special

train traveling over the state. He is a thorough believer in pedigree corn which is to become the staple product of Iowa, thus enriching the tiller of the soil and through him the whole state. A notable feature of the census report, said Professor Beach, is the fact that the largest number of people who own the farms on which they live are the horticulturists, a condition very gratifying and satisfactory.

VOICE FROM ILLINOIS.

Pioneers in Horticulture was the subject discussed by Arthur Bryant, a retired fruit grower and a member of the Illinois Horticultural society. He sketched the origin of the society of which he is a member and traced its growth up to the present time, recounting also the growth of similar societies in adjacent states. In those early days he found a keen degree of earnestness in the work. At one meeting held in Princeton, Ill., two men from Wisconsin drove across the country to attend the session, the journey requiring from 10 to 12 days. The necessary funds for the work of the early societies was met by the members, who went down into their pockets for the hard earned cash, quite in contrast to the present day methods, which invoke the aid of the legislature. Mr. Bryant paid a high tribute to the earnestness and integrity of the pioneers who are rapidly passing off the stage of action.

PREACHER HORTICULTURIST.

"I believe there is a relation between horticulture and theology," said Dr. Updike, who announced that agriculture and horticulture were his avocation but his vocation was something else. He admitted that he obtained a keen degree of pleasure in caring for his hundreds of trees and shrubs, but was a trifle reticent about the amount of profit derived therefrom. Nothing develops men better than the life of a horticulturist or farmer and 'tis a blessing to a boy to have the privilege of living and working on the farm.

The life of a tiller of the soil develops originality, he who puts brain into his work does not need entertaining, as the inspiration comes to the man who is thus engaged, lending a charm to every day of existence. Dr. Updike claimed that boys would not leave the farm if the parents would make a

home in the best sense of the word, for in the country is the ideal spot for the true home to be made. He deplored the lack of taste displayed around the average farm residence and the apparent indifference and neglect manifested in the appearance of the grounds around the farm house. Here is where the work of the horticulturist comes in, and it has commercial value. It becomes the property of the public, affording enjoyment to all who pass by. There is as much real art in the proper arrangement of trees and shrubs as in the work of the artist. He pleaded for the establishment of a course of landscape architecture in the university, and felt that it was as great a nuisance to have architectural eyesores as those of an odorous nature. Dr. Updike's topic was The Use of Brains in Horticulture, and, as the toastmaster put it, "he practiced what he preached."

HISTORY OF HORTICULTURE.

A professed student of history has a keen interest in horticultural matters, said Dr. R. G. Thwaites, secretary of the State Historical society, who felt a degree of affiliation with the members of the society in their work. Dr. Thwaites claimed that at the age of 15 he had been led astray by reading that eloquent book, Gardening for Profit, this being followed by Ten Acres Enough. Dr. Thwaites and his brother then had an attack of chicken fever and succeeded in getting all the diseases known to the fowls in the coop. After three or four years' experience the young horticulturists were thoroughly disillusioned and convinced that the whole thing was a delusion and a snare. Dr. Thwaites was particularly happy in his illustrations of "things are not what they seem," the story of a Norwegian maiden being especially apt.

The extensive work being done by the horticulturists throughout the state led Dr. Thwaites to relate the strenuous work done in the Fox river valley whence come the delicious pears, while he was in search of precious manuscript for the society. He responded to the toast, In the Days of Old.

MADISON A CITY BEAUTIFUL.

"The success of a speech depends upon the sympathy of the crowd," said A. Brackett, a Minnesota horticulturist, and by

his application of the sentence brought down the house. He urged the planting of trees to beautify the homes and incidentally pay a tribute to Madison for general beauty and attractiveness. He responded to the toast Gophers and endorsed the oath of the Minnesota horticulturists, who swear that "we will support the Minnesota State Horticultural society, the Wealthy apple and the constitution of the United States."

L. A. Goodman of Kansas City, Missouri, was the next speaker. He is the most extensive fruit grower in the state having, it is said, over half a million apple trees, besides small fruits. Mr. Goodman is president of the American Pomological society and a man of great influence in fruit growing circles. He said we need poverty to force us to do things; it is an impelling power both in the state and nation. This is the day of microbes and the struggle with these enemies is what makes us grow, the more we fight them the greater is the resistance on their part, all of which makes for our good.

The last speaker was W. G. Moyle of Union Grove, who was introduced as the smartest, snappiest member of the society. He proved that his term was not a misnomer, as his remarks were permeated throughout with anecdote and story, the whole being in a happy vein.

A MEMORIAL ADDRESS.

A. G. TUTTLE, Baraboo, Wis.

BY FRANKLIN JOHNSON.

A. G. Tuttle was one of the charter members of the Wisconsin State Horticultural Society and one of its early presidents, succeeding in this office his beloved friend the late J. S. Stickney.

Mr. Tuttle was born December 30, 1814, in Watertown, Connecticut, hence was a native of that "Litchfield County" famed as the birthplace of Mrs. Harriet Beecher Stowe and other members of the illustrious Beecher family. At that time the very air was surcharged with the love of liberty and the

hatred of slavery. Mr. Tuttle, in the enthusiasm of his young manhood, became an ardent abolitionist. Before attaining his majority he made abolition speeches and under the direction of William Lloyd Garrison assisted in editing a little abolition paper. At the early age of nineteen he went to New York city to take charge of a large wholesale store, being recommended for the position by Seth Thomas, the renowned maker of clocks. After a year or two of strenuous but successful work in this store his failing health compelled him to return to his home in Connecticut. In 1838 he was married in Northfield, Conn., to Miss Elizabeth F. Clark. Their first home was in New Haven, where Mr. Tuttle had again engaged in mercantile business. In the autumn of 1846 he came to Wisconsin, stopping awhile in Madison, then going to Portage, where he conducted for Nat Dean of Madison the first store ever run in Portage. In the spring of 1848 he moved to Baraboo, where in the autumn he was joined by his wife and son whom he had left in Connecticut. For several years he was engaged in trade, but in 1854 he purchased the farm which was his home for more than fifty years. He at once commenced planting an orchard and became enthused with a love of fruit culture that continued unabated until his death. With a view to making Wisconsin a land of orchards, like New England, he began the sale of fruit trees in 1858, thus establishing the first nursery in this section.

When Abraham Lincoln was president and Cassius M. Clay was our minister to Russia Mr. Tuttle and his son procured cions of Russian apples with the hope of securing varieties that would withstand the severity of the Wisconsin climate. This was the first direct importation into the United States of Russian fruits. With these cions, they began the testing of Russian varieties. In 1866 he set out his famous Russian orchard which has attracted the notice of horticulturists throughout the country.

In the summer of 1904 his failing strength led him to leave his farm and go to the home of his son Herbert, in Water Mill, Wis. Here he was tenderly cared for until his death which occurred July 25, 1905, at the age of 90 years and 6 months. During the spring and summer he was able to be about the house and grounds until he was stricken with paralysis a week before his death. Up to that time he retained his intel-

lectual powers and his talent for repartee. The funeral was at the son's home in Water Mill, but he was buried in Baraboo by the side of his beloved wife who died in 1902, soon after the sixty-fourth anniversary of their marriage. They are survived by three sons, Herbert B., of Water Mill, Merritt I., of Fort Morgan, Col., and Edward K., of Mather.

Such, in brief, are some of the leading facts in Mr. Tuttle's life. Dates and data are cold and commonplace, but the Mr. Tuttle whom we knew and loved,—our Mr. Tuttle—was neither neither cold nor commonplace. He had a warm heart, an active brain, a quick eye and a ready hand. The various qualities that made the man were combined in such a way that they formed a striking personality. The vigorous intellect, the sterling integrity, the indomitable will, the tireless energy, these Corinthian pillars of his character, were reflected in the intellectual features, the frank expression, the broad shoulders and the firm tread which made him a noticeable figure in any assembly. I should like to speak at length upon these Corinthian pillars of his character, but time forbids. It also forbids more than a mere allusion to the acanthus leaves which twined so gracefully around them. These grew mainly from the kindness of his heart and from his keen sense of humor. As illustrative of his kindness you will pardon a personal reminiscence. On a winter day when the mercury was away below zero and the wind blowing a gale there came a rap at the door and in walked Mr. Tuttle, a vigorous old man though well past his four score years. As soon as he could get his breath he explained his visit by saying that he had heard I was not feeling well and so had come up to see if I needed any help about doing my chores!

His keen sense of humor led him to store his memory, with an inexhaustive supply of amusing anecdotes which he knew well how to tell, and it led him into the perpetration of numberless jokes. Mr. Tuttle's jokes were peculiar to himself. He would start off in a way that would completely disarm you of any suspicion of what was coming and then treat you to a kindly and good-natured "sell." To me the most amusing feature of the whole affair was his boyish chuckle as he noted your surprise at the unexpected turn he had given to the conversation. One day, when in his ninetieth year, he stopped at my house and said he had been over to see Mr. Miner's show



A. G. Tuttle in his ninetieth year. The vineyard of an acre in which Mr. Tuttle is standing was cared for that year by his own hands.

for a crop of plums. He added, "I find I can beat him this year." Of course I was surprised for Mr. Miner makes a specialty of plums. Mr. Tuttle continued very positively, "I can beat him this year, for I have got *one* plum and Mr. Miner hasn't any." Presently the conversation drifted to poultry. He said that for several years their chickens had been neglected and as a consequence hadn't done very well, but this year there were two hens that had succeeded in raising all the chickens they hatched. It soon developed that these two hens both set in the same nest and by their united efforts they had hatched *one* egg.

One more feature of Mr. Tuttle's career I must mention. "There's a divinity that shapes our ends, rough-hew them how we will." Mr. Tuttle's own plan for his life did not include a horticultural career. He fitted himself for a dry-goods merchant. Circumstances led him into horticulture. Advised by his physician to leave the store permanently, he essayed general farming but the chinch bugs destroyed his grain. Then he went to raising fruit. It afterward developed that he had unconsciously received a special training and equipment for the work he was destined to do. Did his experience in dry goods give him any special training for horticulture? I think so. Mr. Tuttle would handle fruit with the gentlest touch of any man I ever saw. I cannot help thinking that one secret of his success as an exhibitor was his sensitive touch. Yet if you looked at his hand it indicated firmness and strength. Whence came this supersensitive touch? It is a very unusual and remarkable thing in tillers of the soil. Was it not from the years of constant feeling of goods to judge of their texture? His wife, his sons, his farm, his location, his associations, yea, even failing health, chinch bugs, adverse seasons, panics,—all these conspired to make the noted horticulturist.

He never lost faith, he always, saw victory ahead. When honors came to him they rejoiced his heart and the hearts of his friends. He had earned them. Mr. Tuttle was a forceful writer and speaker. He was genial and hospitable. Probably no other home in the northwest has entertained so many noted horticulturists. The close of this long and active life was no "untimely end." He came "to his grave in a full age like as a shock of grain cometh in in its season."

TRIBUTES FROM OTHERS.

From Hayden K. Smith, Editor Chicago Chronicle.

"I held Mr. Tuttle in high regard as a man of strong character and of certain rare qualities which made him of great service to Wisconsin and the northwest in his chosen field of activity."

From Clarence Wedge, President of Minnesota Horticultural Society.

While I had considerable correspondence with Mr. Tuttle, my personal acquaintance with him was limited to one visit at his home, a visit which will ever remain a delightful spot in memory. Mr. Tuttle had invited me home with him from the Madison Horticultural meeting. At that time his wife was living, and I was entertained and looked after by the two, then living alone, each considerably over eighty years old. It has never been my lot to be entertained in a more cordial or graceful way, and I then thought them the most remarkable old people that I had ever met.

No sweetheart ever welcomed her lover with a more tender and graceful expression of affection than this delightful old lady her husband of sixty years, and the few hours of my acquaintance with her was a revelation of a beauty and loveliness peculiar to old age that I had never thought of. The grave does not, it simply can not, hold such a spirit.

I had arrived at night. The next morning Mr. Tuttle took me through his large orchard, wading through the deep snow, telling me the peculiar traits of each tree, talking of his future plans with all the vigor and enthusiasm of a man just entering the arena of life. Not a word of past failures or discouragements, or one doubt of the future. It was all a great cheer and uplift to me that can not be forgotten, and I am glad to acknowledge to my fellow horticulturists the great lessons taught me by those two wonderful old people.

From Prof. Samuel B. Green of the Minnesota Experiment Station.

Mr. A. G. Tuttle, late of Baraboo, always impressed me as a man of keen judgment, who meant to be perfectly just in what he did, and feared nothing. As a horticulturist he was progressive, energetic, far sighted and reliable. I felt when he died that I had lost a dear personal friend.

I would be very glad to add more to this memorial, but take it that you would not have space for more than this.

I think I shall plan to have a photograph of Mr. Tuttle for my gallery of eminent northwestern horticulturists, to hang in my class room.

From A. J. Philips, a Charter Member of the Wisconsin State Horticultural Society.

I always held Mr. Tuttle and his good, faithful wife in the highest esteem. I visited them many times and always admired his pluck and energy. He was ready to add a helping hand to anything he conscientiously thought right, and just as ready to pronounce his disapproval of anything he thought was wrong or misleading. You always knew where to find A. G. Tuttle when you asked his opinion. He was vice-president from Sauk county at the organization of the State Horticultural Society at Janesville in 1856 and was a hardworking, worthy member during all the years since. He personally exhibited apples after he was eighty years of age.

IN MEMORY OF MY FRIEND, A. G. TUTTLE.

Geo. J. Kellogg, Charter Member of the State Horticultural Society.

In reviewing my horticultural work in Wisconsin since 1852 very few men have stood higher in my estimation than A. G. Tuttle. He was most active and enthusiastic in introducing the Russian apples, in correcting their nomenclature, in selecting and in proving their adaptation. No one ever took more pride in showing the finest exhibits of the Russian and American apples. Mr. Tuttle was ever to the front in Wisconsin horticulture and his place can never be filled.

HENRY FLOYD.

Dr. Loope: It seems to devolve upon me to say something of our Mr. Henry Floyd, who died last spring, and I cannot give you the date; unfortunately his family were not in the state, or where I could see them, they were at Eureka Springs, and the daughter wrote me that she thought perhaps I could say a few words about her father here.

The end with Mr. Floyd came very suddenly on a Sunday afternoon. He was reading the newspaper to his wife and he had been reading some time when he seemed to hesitate and she said, "Why don't you go on?" and the paper fell, and the mentality of Mr. Floyd was gone. I was there within two minutes and knew that the end was near and there was no consciousness left. He lived very close to me. I have known Mr. Floyd for more than thirty-five years. He was a strong man physically and mentally. He was an energetic man, he was unceasing in whatever he laid his hand to. He also retained his mental powers in quite a good degree up to the time of his death. For a year or two he had some premonition of this same end, at least so it seemed. He had sudden attacks of dizziness and the winter before he spent in Eureka Springs with his son and was attacked there, so that they were quite sure that something was coming to him and spoke to me about it, still he went about as usual up to the time of his death.

He very early engaged in horticulture. He planted an orchard in the town of Aurora, near Eureka many years ago; I think in the fifties, and had a successful orchard there for a good many years. However, he planted the old varieties that succeeded in the East and they could not succeed in his location for any great length of time. Still, in 1885 he had a great many apples there. He also was engaged in raising some fruit stock; he always was grafting some apples or some plums or pears, and he always had a plot of them, even up to the time of his death, and after he left his farm life and came into the village, I have seen him drive out a great many times about three miles to a little plat of ground where he had been grafting plums and pears and apples and things of that kind. He took a great deal of pride in the plat and of late years he never sold them, he let rabbits eat them up, and of course gave some away.

He was a man, as I said, of strong mentality, a strong character, somewhat intolerant in his opinions, he generally thought with a great deal of care, he may not have been always right, but he was always very sure that he was nearly right, and that was a characteristic of the man. He was always present at the local horticultural society, and I think attended the State Horticultural Society very closely for a good many years, not always of late years. Many of you know him and have known him for years, and you have your estimate of his character as well as I. He was a thorough horticulturist always, it was his pride and his hobby and he continued in business as long as he lived.

SPRING FLOWERING BULBS.*

F. Cranefield.

The spring-flowering bulbs are a joy and a blessing. Flower beds and borders that would otherwise be bare and unsightly in the spring may, if filled with tulips, be a blaze of color for weeks. Those with crocus, narcissus and others of the Holland bulbs, will give an abundance of bloom before the annuals and the summer flowering plants may be safely planted. In order to have this it is necessary to plant in the fall. October is the month for preparation for this brilliant spring show. But the planting may be done any time before the ground freezes.

Crocus, tulips and similar bulbs are grown in Holland and are sent to us in late summer or early autumn and may then be had from florists or seedmen dry and dormant. The bulbs have in their thickened leaves a storehouse of food surrounding the perfectly formed embryo blossoms. We need only to plant them in rich well drained soil any time before the ground is frozen and cover with a mulch of heavy leaves. However, in order to meet with full success we must observe certain practical considerations.

PREPARATION OF SOIL.

The beds where summer flowers have been growing should now be cleared of rubbish, the soil deeply spaded and well pulverized. Deep tillage is essential, as the roots of bulbous plants strike straight downward, branching but little.

*Reprint of Bulletin No. 3, Wisconsin State Horticultural Society.

DRAINAGE.

The soil must be light in texture and well-drained, as the bulbs will decay if water settles about them. If the soil is a heavy clay it will be well to raise the beds a few inches to insure perfect drainage.

MANURE.

It is not essential that the soil should be very rich. It is more important that it be light and porous. Use only thoroughly decayed manure. Fresh manure will cause the bulbs to decay.

PLANTING.

Tulips, etc., are usually planted in "designs" or masses of contrasting colors. As the bulbs of the different varieties are all much alike in appearance great care is necessary in handling to avoid mixing. After the beds are prepared for planting and the design outlined the bulbs may all be set on the surface of the bed, placing all of one kind before commencing with another.

Make the holes for planting with the fingers. Cover lightly and after planting compact firmly the whole surface of the bed by walking over it. Do not push the bulbs into the soil without first making holes, for this leaves them on a bed of hard soil and the straight downward growing roots will tend to push the bulbs to the surface.

WINTER PROTECTION.

The bulbs here recommended for planting are all hardy in the sense of power to withstand cold, but all require a winter mulch to prevent alternate freezing and thawing. This is best put on after the ground is frozen and may consist of 3 to 6 inches of leaves or strawy manure. Field mice are very fond of bulbs and are apt to harbor in the mulching if it is put on before heavy frosts.

SPRING TREATMENT.

Uncover early in the spring as soon as their first leaf buds appear. Do not fear late spring frosts, as tulips, etc., suffer but little or not at all from freezing if the growth is made in the open. There is greater danger of injury by frost to the spindling growth resulting from delayed removal of the mulch.

SUMMER TREATMENT.

After flowering the tops turn yellow and die and the bulbs may be allowed to remain in the ground for a second and even a third year. Annuals and bedding plants may be planted without disturbing the bulbs. In case it is desired to remove them immediately after flowering dig carefully and "heel-in" or transplant closely in rows in the garden and leave until the tops die; then lift the bulbs, dry a day or two in the sun and store in a dry place until fall.

KINDS TO PLANT.

Tulips.

There are several classes (trade lists) of tulips, but the single early sorts are most satisfactory for outdoor culture. The following kinds are of like period of flowering and of the same height, two important features in large beds:

Red—Crimson King, Artus, Belle Alliance.

Yellow—Chrysolæ, Yellow Prince.

White—Pottetakker, Cottage Maid, La Reine.

Variegated—Keiserskroon.

The Duc Van Thol class is somewhat earlier than the above, but with smaller flowers. These may be had in scarlet, rose, yellow, white and crimson.

The Parrot tulips have curiously shaped blossoms with fringed petals. These are odd but not adapted to massing.

The Darwin, Byblooms and Bizarres are single late kinds, growing 2 to 3 feet in height. More prized for cut flowers than for bedding. Very late and cannot be used where the beds are wanted for summer flowers.

All so far named are single. Double flowered sorts may be had in all the shades of red as well as yellow, white and variegated.

Plant tulip bulbs 3 to 5 inches deep (bottom of the bulb) and 4 to 6 inches apart.

Narcissus.

Of the different classes of narcissus the daffodil or trumpet narcissus is most satisfactory for out-door planting. The Trumpet Major, single, and Von Sion, double, are two satisfactory kinds; both rich golden yellow.

The Pheasant's Eye, white with yellow center, is also hardy. The Polyanth class, of which Paper White is a representative, is not hardy out-doors in Wisconsin.

Hyacinths.

Hyacinths are much admired on account of their delicate colors and delightful fragrance. The single sorts are to be preferred for bedding, as the flower spikes are the more graceful and not as likely to droop as the heavier double ones. Various shades of blue, red and yellow may be selected from the lists of dealers. The following are good: Robert Steiger, Grand Vainquer, Voltaire, Chas. Dickens and Czar Peter.

Hyacinths will not thrive in wet, heavy soil. Light, sandy loam is best. The bed should be spaded to a depth of 18 inches or more and thoroughly pulverized.

Plant 6 inches deep and 6 to 8 inches apart.

Crocus.

The crocus is the earliest of the spring flowering bulbs to blossom and if planted in borders or grass plots may remain for years undisturbed.

Plant 2 to 3 inches deep. The plants require but little room and may be set 2 to 3 inches apart if desired.

The kinds here mentioned are the ones commonly planted in beds and borders. A few others, as the Snowdrop, Scilla, etc., may be added if one desires a collection.

PLANT A FEW.

of each and brighten the home in the early spring. But little room is required and the culture is simple.

CHILDREN

love flowers. Let them make a tiny bulb garden. They may plant with their own hands, cover them for their long winter sleep and watch day by day in the spring the opening buds. This will be "Nature Study" at its best.

TEACHERS

often plan and plant flower gardens on the school grounds only to leave them at the beginning of their beauty as school closes. A bulb garden will be at its best at the time when we wish to draw the attention of the children to things "out-of-doors."

POT CULTURE OR FORCING.

Many bulbs may be easily grown indoors and furnish a succession of bloom from Christmas until spring. Tulips do not

force readily but all of the narcissus family, including the Chinese or sacred "lily," the miniature hyacinths and many others are easily grown.

SOIL.

A rich garden soil mixed with leaf mold and sand should be used. Do not use heavy clay soil nor fresh manure. Unless thoroughly decayed fine manure can be had it is better to use none at all. The compost should be well mixed and sifted before using.

POTTING.

Four and five-inch pots are commonly used. Fill these half full of soil, place the bulbs on this, one hyacinth or 3 to 4 tulips in a 4-inch pot, and fill to one-half inch of the top. Water thoroughly, place in a dark corner of the cellar and cover with earth or sand. This is for the purpose of developing root growth in advance of leaves. If left in the light the leaves would develop before roots were formed and exhaust the bulbs, leaving no energy for flower development. If the soil is kept moist by frequent sprinkling, in 5 or 6 weeks the pots will be well filled with roots. A few may now be brought to the light and the remainder retarded by removing to a cooler place.

Light wooden boxes 4 to 5 inches deep may be used in place of pots.

WATER CULTURE.

Hyacinths may be grown in water. Glasses for this purpose may be had at florists. Large-necked bottles will answer as well. Fill with water and place the bulb with the base resting on the water; place in a warm, dark closet, keep the bottle filled with pure water and when the roots are 3 to 4 inches in length bring to the light.

The Chinese lily or narcissus may be grown wholly in the light. The large forked or branched bulbs may be placed in water in a shallow dish in the window with a few small stones to support the roots. No further care is necessary beyond renewing the water supply as exhausted.

SPRAYING.*

F. Cranefield.

The successful culture of fruit demands a knowledge of tillage, fertilizing, pruning and the methods of combating insects and diseases.

It is mainly the lack or acquirement of knowledge concerning the enemies of the crop that distinguishes the successful from the unsuccessful fruit-grower.

Animal husbandry demands skill in feeding and the general care of animals, but diseases as a rule are left to the veterinarian, but when our fruit trees are affected we must be our own doctor.

Trees may be totally neglected after planting and eventually give some sort of returns, but such practice is not worth while. If fruit trees and plants cannot be properly tended none should be planted, for the results will be disappointing.

Two classes of enemies attack fruit trees and plants, viz.: insects and fungous diseases; the application of substances, usually liquid, to the tree or plant for the purpose of preventing or destroying these constitutes spraying.

We spray to destroy insects and to prevent fungous diseases. Spraying is no longer an experiment. It is an established fact that intelligent and persistent spraying always pays.

The effects of spraying are cumulative. The effects of spraying last year and this year may result in an increased yield next year.

Spraying is not an exact science; we may and indeed should modify methods and formulas to suit conditions. The beginner need not fear that his trees will be ruined by lack of knowledge relating to the full and exact methods of preparing formulas for only by gross carelessness or utter disregard of simple directions could such results occur.

Certain points, however, should always be observed. Three of these are so clearly stated by Lodeman† that they are given here verbatim.

"First, be on time. Make an application when it will do the most good, and never allow that time to pass if it can possibly be avoided. Every delay is of advantage to the parasite, and it will be used so well that in most cases the injury cannot be re-

*Reprint of Bulletin No. 4, Wisconsin State Horticultural Society.

†The Spraying of Plants. Lodeman. P. 226. Published by the Macmillan Co., 66 Fifth Ave., N. Y. Copyrighted.

paired. The destruction of one insect may mean the destruction of hundreds, and one application made at the right time may mean, and generally does mean, the protection of a plant against millions of spores of fungi which are endeavoring to gain a foothold. Be ready for action at a moment's notice, and when that moment comes, spray!

"Second, be thorough. When spraying a plant, spray it well, With a little care, a complete success may be obtained instead of only a partial one. When the work is finished, the grower should have the feeling that it is well done, and then no fear as to the result need be entertained. Spraying is not always pleasant work, and the temptation to slight it is often strong; but the operator will be rewarded just to the extent to which he has been painstaking, and to that extent only.

"Third, apply sprays intelligently. This is really the most important factor of the work, although good crops can be obtained without it, provided directions are followed. The first two points cannot be neglected without injury to the crops, but this one can be. The crop is in need of the applications only, but the grower should know the reasons for them, and should conform with the character of the insect or the disease which is being treated, and with the season. Every year and every day such knowledge will be of value. So many things are still unknown, and so many points still in dispute, that personal knowledge and judgment about individual cases are not only desirable, but very essential. Directions covering the majority of cases can be given, but now and then one will come up which seems to differ from all others, and it is then that this knowledge will prove most valuable.

In order to derive the best results from spraying we need a knowledge of the life history of the insects and diseases commonly affecting our plants.

In a publication of this nature it is manifestly impossible to enter into a wide discussion of these subjects. Several excellent books have been published which present the subject in full. A perusal of one or more of these supplemented by close observation will be helpful.

An acquaintance with certain elementary facts, however, is essential to any intelligent work in spraying.

THE TRANSFORMATION OF AN INSECT.*

"To fight an insect intelligently one must know its life history. There are certain periods in its life when it is vulnerable

*Prepared, by request, by C. F. Bues, State Nursery Inspector.

and others when it is protected. This change of conditions is largely due to the fact that most insects in the course of their lives undergo a great many changes of form; they undergo a "*transformation*." Mostly the various stages of this transformation look so different that if we did not know, we would set them down as different animals. Thus we have insects with a complete "*metamorphosis*," which comprises four stages, and those with an incomplete metamorphosis with less stages. The stages of one of the higher insects with a complete metamorphosis being known, we can infer the corresponding stages of most of the lower forms.

As an illustration the four stages of one of the most destructive, and yet by most people little known insects, the *codling-moth*, which in one stage is the "apple worm" are here placed in the form of a life cycle.

I. The egg is laid on the apple.

II. From the egg hatches the *caterpillar* or apple worm, which eats its way through the blossom end into the apple. *This is the only stage in which an insect grows.*

III. The caterpillar has changed to a *pupa*, a *resting stage*, under the bark of the tree.

IV. Out of the pupa emerges the *moth*, the *adult insect*. In this stage reproduction takes place and we begin our cycle over again with the egg.

To these insects which go through these four stages belong the butterflies, beetles, bees and flies. Some insects lack the resting or pupa stage, and the young, when hatched, resemble the adult to some extent. These are insects with an *incomplete "metamorphosis."*

The insects affecting fruit may be divided for convenience into two classes, which are distinguished by their mode of feeding, viz., eating or chewing insects and sucking insects.

Eating insects consume the affected tissues, commonly the leaves, and thereby hinder the functions of the plant. Common examples are the potato "bug" or beetle; the currant worm which defoliates currant and gooseberry bushes twice in the season; the larva of the codling moth, which causes wormy apples; the plum curculio; the tent caterpillar and others.

Insects of this class are destroyed by poisoning their food. The parts of the affected plants consumed are covered with a poisonous substance which is eaten with the plant tissues, causing death. Insects that eat only the foliage are easily destroyed and should cause no great concern. Usually a single

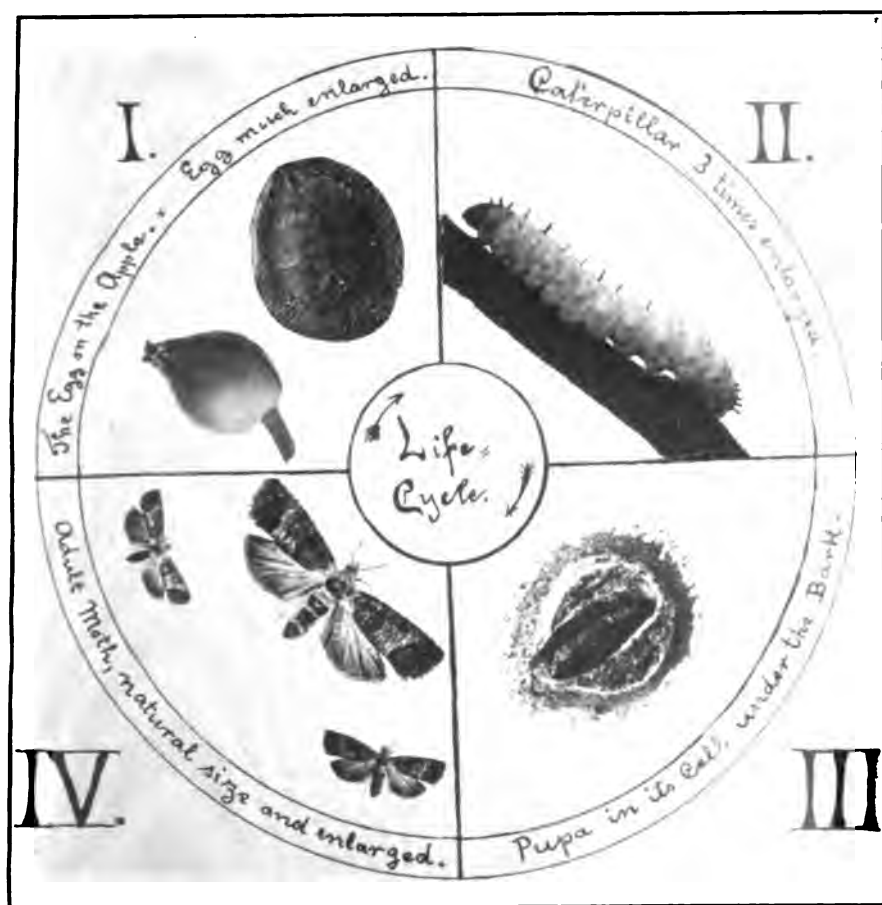


FIG. 1.—Life cycle of codling moth. Prepared by C. E. Bues from photographs furnished by Prof. M. V. Slingerland.

application of paris green or other arsenite is sufficient. Insects that attack the fruit are more difficult to control.

Sucking insects do not consume the external tissues of the plant but feed only on the sap. In order to accomplish this the insect thrusts its proboscis through the external coverings and sucks the juices in the same way a mosquito sucks blood. As these insects do not consume the tissues of the leaf or branch poisons are of no avail. Even if the surface be thickly covered with a layer of poison the aphid will thrust its beak through it as well as through the epidermis of the leaf to reach the plant juices beneath. We must therefore attack the insects. This is done by covering them with some caustic substance which will penetrate their bodies or with an oily substance which closes their breathing spores.

Sucking insects cause less damage in Wisconsin at present than biting insects. To this class belong the numerous aphidæ or plant "lice," which attack the young growing shoots of fruit trees, roses, etc. Occasionally nursery stock is injured to some extent by aphids and plum trees are sometimes checked in their growth, but on the whole the injury is slight.

To repeat:

- (1) Biting or chewing insects are destroyed by placing poison on the parts on which the insects feed.
- (2) Sucking insects are destroyed only by attacking the insects and for this class poisons are of no avail.

PLANT DISEASES.

Apples scab, brown rot of plums and peaches, potato rot, blight, rust and other destructive plant diseases are commonly ascribed to weather conditions. *Indirectly* this is often true, but neither rain nor drought, nor any other atmospheric condition is ever *directly* the cause of plant diseases.

"Such diseases, as already indicated, are produced by minute plants, which never arise spontaneously, but always from some * * * reproductive form of a previously existing plant of the same species. But weather conditions may be favorable to the rapid development of these fungi, and so indirectly cause the disease."

Rainy weather, then, does not directly cause plum rot, but provides conditions favorable to the development of the fungus and probably unfavorable conditions for the development of the plum and its ability to resist the invasion of the disease.

*Weed, Fungi and Fungicides, p. 11.

What is a fungus?

It is a plant; a plant without leaves, flowers, seeds, of chlorophyll.*

It cannot therefore prepare its own food, but must feed on other plants.

There are two classes of fungi: saprophytic, which live on decayed or decaying vegetable tissues, toadstools, mushrooms, etc., are examples of this class; and parasitic fungi, which exist on living plants or their fruits, absorbing the prepared nourishment. It is mainly the parasitic class which concerns the fruit grower, for it is this class which causes plant diseases.

Fungi are propagated by spores, minute bodies which may float in the air, and are usually too small to be discerned singly without the aid of a compound microscope; collectively these form a dust-like substance as in bread mold, mildew, etc.

These spores alight on leaf or fruit and under favorable conditions of heat and moisture germinate, giving rise to thread-like projections (hyphae) which penetrate the plant's tissues. These root-like bodies multiply with great rapidity, feeding upon the juices of the affected plant, forming the *mycelium*.

After a time, certain of the modified mycelium (conidia) grow to the surface and produce there spores which are again disseminated. This, in brief, is the life history of a fungous disease. Countless modifications occur with the different species; the spores of some sorts perish soon after dissemination, while others may survive for an indefinite period; some species give rise to two sets of spores, one of which is of brief existence, while the other may persist over winter, etc.

The main fact to be borne in mind is this: The spores which may be present in innumerable numbers may be destroyed or their germination prevented by the application of certain substances known as fungicides *while existing as spores on the outside of plants*, but after the hyphae have penetrated the tissues of leaf, stem or root spraying is of no avail. In other words, spraying for plant diseases must be wholly for prevention.

Laboratory investigations appear to show that the spores of many common fungi are not destroyed by insecticides and that these are effective only in the short time intervening between germination and the entrance into the tissues of the plant by the hyphae.

*Chlorophyll is the green-colored substance found in flowering plants which enables them to change the crude food, i. e., minerals of the soil to nutritive material (plant tissues) that can be used by animals and plants.

INSECTICIDES AND FUNGICIDES.*

No extended list of formulas will be given in the following pages. In fact, out of the long list of remedies published from time to time but two insecticides and one fungicide are now recognized as standard remedies, viz., an arsenical poison for biting insects, kerosene emulsion for sucking insects and some form of copper for fungi.

INSECTICIDES.

(For biting insects.)

Paris Green.

FORMULA.

Paris green	1 lb.
Fresh (unslaked) lime	1 lb.
Water	200 gallons

Paris green is heavier than water and the mixture must be kept in constant motion during spraying operations to prevent settling.

It is often adulterated.

Gypsum and slaked lime are two adulterants commonly used.

Pure Paris green dissolves without sediment in ammonia, the adulterant will not. This affords a simple test for purity.

Paris green if used on growing plants greatly in excess of the above formula may injure the foliage. The addition of the lime overcomes the caustic properties and renders it safe under all conditions.

Dry Paris green may be used pure if applied in small quantities. Different "Dry powder guns" have been invented for this purpose.

Arsenate of Lead.

(A poison for biting insects.)

FORMULA.

Arsenate of lead	2 lbs.
Water	50 gallons

Arsenate of lead is a combination of white arsenic, sugar of lead and sal soda. It may be prepared by combining these materials in proper proportion, but the process involves com-

*"Any substance which is used to destroy or repel insects may be termed an insecticide; and any substance which destroys fungi, or which prevents their injurious growth on vegetation, a fungicide. No substance, so far as known, will answer both purposes equally well."—Lodeman.

siderable labor and danger, as the ingredients must be combined by boiling. At least two firms now offer this valuable insecticide prepared ready for use, viz.:

The Bowker Insecticide Co., Boston, Mass., and The Merrimac Chemical Co., Boston, Mass.

The Bowker Company's preparation is sold as "Disparino" and the other as Swift's "Arsenate of Lead."

Arsenate of lead is less liable to injure foliage than Paris green.

It remains longer in suspension.

It adheres better to foliage.

It may be used for any purpose for which Paris green is employed in liquid sprays. Disparino was used in spraying the Wausau orchard the past season (1904) and with perfect satisfaction.

White Hellebore.

(For biting insects.)

Powered white hellebore is commonly employed to destroy currant and cabbage worms and on fruits and vegetables where more poisonous substances cannot be used with safety.

FORMULA.

White hellebore	1 oz.
Water	2 to 3 gallons

It may also be used dry either alone or mixed with flour, land plaster, soot, etc.

White hellebore is scarcely poisonous to the higher animals and may be used freely on fruits and vegetables at any stage of maturity.

INSECTICIDES.

Kerosene Emulsion.

(For sucking insects.)

Used only to destroy sucking insects. It must be applied to the insects and cannot be used as a preventive.

This is the standard remedy for sucking insects.

FORMULA.

Dissolve 1 lb. hard soap in 2 gallons of boiling water.

While hot add 2 quarts of kerosene.

Churn or shake the mixture while hot for 5 to 10 minutes or until it assumes a creamy consistency.

Add 6 gallons of water before using.

Another plan consists of using sour milk instead of soap water, the object in either being to hold the kerosene in suspension while it is applied to the insects.

The most approved method of applying kerosene is by means of a special pump designed to mix kerosene and water. These pumps are made by different firms in various sizes from a hand pump or syringe which may be had for 75 cents, to a barrel pump costing \$20.00. This is the cheapest, most agreeable and by all means the best method of applying kerosene.

FUNGICIDES.

The control of fungous diseases is accomplished by the use of some form of copper salts, usually copper sulfate or copper carbonate.

The former, known also as blue-stone, blue vitriol, etc., is generally recognized as more efficient than the latter. When purchased in large quantities it is also cheaper.

Copper sulfate may be used on dormant plants when dissolved in water at the rate of 2 lbs. to 50 gallons of water, but *this solution must not be used on growing plants.*

Copper sulfate in combination with fresh lime forms the standard and well known fungicide.

Bordeaux Mixture.

Various formulas are quoted, but the following is now accepted as safe and reliable:

Copper sulfate	5 lbs.
Fresh lime	5 lbs.
Water	50 gallons

In general terms, the copper sulfate should be dissolved in one-half of the water, the lime slaked in the remainder and the two solutions poured together. This results in a chemical action giving rise to a new substance preserving the fungicidal properties of the copper sulfate and if properly made will not injure foliage.

HELPFUL HINTS IN MAKING BORDEAUX MIXTURE.

- (1) Have on hand three barrels and two pails (wood or fiber).
- (2) Twenty-five gallons of water in each of two of the barrels.

(3) Dissolve 5 pounds of copper sulfate in one barrel by suspending in a coarse burlap as near the surface of the water as possible; in this way it will dissolve in a few minutes, while if allowed to settle to the bottom it would require several hours or even days to dissolve.

(4) Place the lime in a pail and slake by adding water slowly until a paste is formed. (The lime for Bordeaux mixture should be slaked exactly as for building purposes.)

(5) Pour this lime paste into the second barrel and stir thoroughly.

(6) Now pour into the third (empty) barrel first a pailful of the copper sulfate solution then a pailful of the lime water, or better, let two persons work at the job, pouring together.



FIG. 2.—Illustrating method of making Bordeaux mixture. Adapted from Farmers' Bulletin No. 38. B. T. Galloway, author.

(8) The resultant mixture should be of an intense blue color. If any tinge of green appears it is not good Bordeaux mixture.

(9) The lime-water should be strained to remove the coarse particles which serve to clog the nozzles in spraying.

(10) Sufficient lime must be used to combine with all of the sulfate or harm will result. The formula given above provides an excess, but such excess is preferable to a slight deficiency. Use all of the lime water.

(11) Test the mixture. It is always advisable to test every barrel of the mixture before using to detect the presence of any free or uncombined copper which might injure foliage.

TEST NO. I.

Dip a bright, clean steel knife blade into the prepared Bordeaux mixture; if any, even the slightest, deposit of copper ap-

pears on the blade after a few minutes' exposure to the air it is an indication that more lime is needed.

The knife blade should be thoroughly whetted before using for a second test. While this is simple and fairly reliable,

TEST NO. II,

or the ferro-cyanide of potassium test is more accurate.

Ferro-cyanide of potassium may be purchased at any drug store.

Place a small quantity (1 oz.) in a bottle and add water slowly until nearly all of the yellow crystals are dissolved. Stir the Bordeaux thoroughly and dip out a few ounces in a saucer. Add a few drops of the ferro-cyanide solution; if any brown discoloration appears it is an indication that more lime is needed. This is a delicate and reliable test.

The ferro-cyanide is a violent poison and should be labeled as such.

Three Things to Avoid in Making Bordeaux Mixture.

(1) Do not use iron or steel vessels for the sulfate or Bordeaux. Not only will these be corroded but the chemical action resulting from continued contact may injuriously affect the mixture. Tinned or galvanized pails are unsafe, as the zinc or tin coating is apt to be imperfect. Use only wood, copper, earthenware or glass.

(2) Do not dissolve the sulfate and lime each in 2 to 4 gallons of water as formerly recommended and then mix the concentrated solutions; curdling will result and after dilution difficulty will be experienced in keeping the lime and water in suspension.

(3) Do not fail to stir the ingredients while mixing and the resultant mixture when spraying. If allowed to settle the only portion possessing fungicidal value quickly settles.

The Use of Stock Solutions in Preparing Bordeaux Mixture.

If more than one barrel of Bordeaux is required much time may be saved by using stock solutions.

Dissolve 50 lbs., for example, of copper sulfate in 25 gallons of water by suspending in a coarse sack as advised above; slake 50 lbs. of lime in another vessel and dilute to 25 gallons; two and one-half gallons from each stock solution will then contain the requisite amount for one barrel of Bordeaux.

Such stock solutions may be kept indefinitely if covered, otherwise the evaporation of water from the sulfate solution

would result in a more concentrated mixture and the lime would deteriorate. The lime may be covered with water.

The Bordeaux should be tested when made from stock solutions as when made direct.

This method of using stock solutions is now employed in all extensive spraying operations. In some cases large elevated tanks are used, from which the solutions may be drawn directly into the spray barrel or tank.

Carbonate of Copper.

(Used as a preventive of fungous diseases.)

Copper carbonate 3 oz.
Ammonia (22° Baume) 1 quart

Dissolve the copper in the ammonia, which should first be diluted with 7 or 8 quarts of water, and dilute with 25 gallons of water.

The term "22° Baume" is a trade term used to indicate the strong ammonia of commerce.

Neither this nor any other definite formula is recognized as wholly safe.

It is better to add the carbonate to the ammonia, diluted with 7 or 8 volumes of water, until no more will be dissolved.

This solution must then be diluted at least 100 fold before using.

The advantages ascribed to this preparation over Bordeaux are as follows:

- (a) It is a clear solution and will not discolor foliage, flowers or fruit and as a consequence may be used on ripening fruit.
- (b) It is without sediment.

To offset this is the uncertainty as to the safety of the mixture unless prepared by one skilled in its preparation and the increased cost.

Potassium Sulfid.

(Liver of Sulfur.)

For checking the spread of certain surface feeding fungi, as gooseberry mildew, grape mildew and many of the fungi which cause "damping" of young plants in the seed bed, potassium sulfid may be used to excellent advantage.

FORMULA.

Potassium sulfid 1/2 oz.
Water 1 gallon

The solution must be used as soon as made, as it quickly loses its strength.

COMBINING INSECTICIDES AND FUNGICIDES.

Either arsenate of lead or Paris green may be safely combined with Bordeaux mixture. In fact, in all extensive spraying operations it has come to be a common practice to add arsenical poisons to Bordeaux at every application. By this means biting insects and fungi are controlled at a single operation. No other fact is more important than this in spraying.

Other combinations than the above have been attempted, but with only slight success, as combining kerosene emulsion, Bordeaux and Paris green, etc.

Neither may Paris green be safely used with the ammoniacal solution of copper carbonate. The caustic effects of this combination in some cases are supposed to result from the action of the ammonia in setting free arsenious acid.

SPRAYING MACHINERY.

The application of spray mixtures necessitates the use of some sort of force pump. Spray pumps and machinery may be divided as follows on the basis of efficiency:

(1) Syringes, atomizers or other like devices known as "hand" sprayers, used to spray house plants and small plants in the garden.

(2) Pumps or devices adapted for small gardens where a few currant bushes, small trees, etc., are grown.

(3) Pumps for general orchard and field work and the spraying of shade trees under 50 feet in height.

(4) Large pumps operated by steam or other power and adapted to any class of work, but designed especially for extensive orchard and park work.

The average Wisconsin farmer or orchardist will seek for a pump either in the second or third class.

In addition to these many machines adapted to special lines of work are offered for sale, as potato sprayers, etc.

(1) The cheapest and simplest of efficient pumps may be found in the first class, viz., "hand" sprayers or atomizers. These sell for 50 cents to \$1.00 and some are very excellent little pumps. Their usefulness, however, is confined to a very narrow field on account of the limited capacity for fluids and the very short distance sprays can be thrown.

(2) In this class are bucket pumps and knapsack pumps, and of these the bucket pump is to be preferred. Trees 10 to 15 feet in height may be sprayed with a bucket pump, also bushes, vines, etc. On some kinds a kerosene attachment is

provided, by means of which a mechanical mixture of kerosene and water may be applied to destroy sucking insects. Where but few young trees, bushes, etc., are to be sprayed a bucket pump will answer all purposes, but for extensive orchard work the time employed in refilling the bucket and in transporting the pump and mixture will more than offset the increased cost of a larger pump.

(3) In this class are the various barrel pumps. These are designed to be fitted to an ordinary barrel. This is the most popular kind of pump and it is probable that more of these are used than any other kind. While primarily designed to be



FIG. 3.—Bucket spray pump.



FIG. 4.—Bucket pump with kerosene attachments. The "Success" pumps figured here are made by the Deming Co., Salem, Ohio.

used in a barrel, these may be fitted to a tank or other receptacle.

(4) The large pumps are of interest mainly to park superintendents and owners of very extensive orchards and need not be discussed here.

Prices.

Atomizers, 50 cents to \$1.00.

Bucket pumps, \$5.00 to \$10.00.

Knapsack pumps, \$5.00 to \$15.00.

Barrel pumps, \$10.00 to \$20.00.

Power pumps, with engine, \$150.00 to \$500.00.

With pumps as with other machinery, the best is usually the cheapest in the end. Do not expect to get a servicable pump for a low price. The best pumps have all working parts, valves, plungers and cylinder of brass. A pump that retails for three or four dollars may be of some service in washing windows or carriages, but is of slight value in spraying.

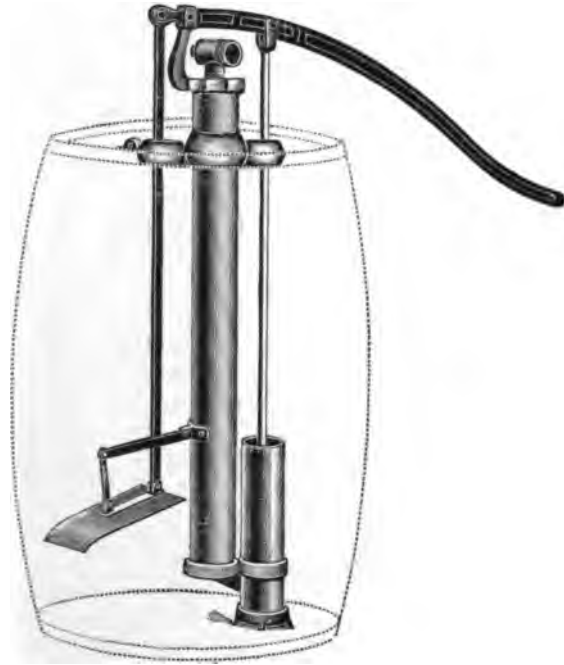


FIG 5.—The "Eclipse" barrel pump. Made by Morrill & Morley, Benton Harbor, Michigan. Other firms offering barrel pumps are as follows: Deming Co., Salem, Ohio; Spramotor Co., Buffalo, N. Y.; E. C. Brown & Co., Rochester, N. Y.; Goulds Mfg. Co., Seneca Falls, N. Y., and others.

Nozzles.

No matter how efficient the pump, good work cannot be accomplished without good nozzles. Many kinds are offered for sale, but of the multitude of forms but two types are in common use. These are represented by the "Bordeaux" and the "Vermorel."

In the former the spray is formed by the fluid being forced against metal obstructions after it leaves the nozzle proper; in the latter a rotary motion is given it within the nozzle, breaking the fluid into extremely fine particles before it leaves the nozzle.

The "Bordeaux" is adapted to use where the spray must be thrown several feet and in windy weather, but it cannot be graduated to produce as fine a spray as the "Vermorel" and is not, therefore, as economical of material as the latter. As nozzles are not a large item of expense in a spraying outfit it is well to have both kinds at hand.

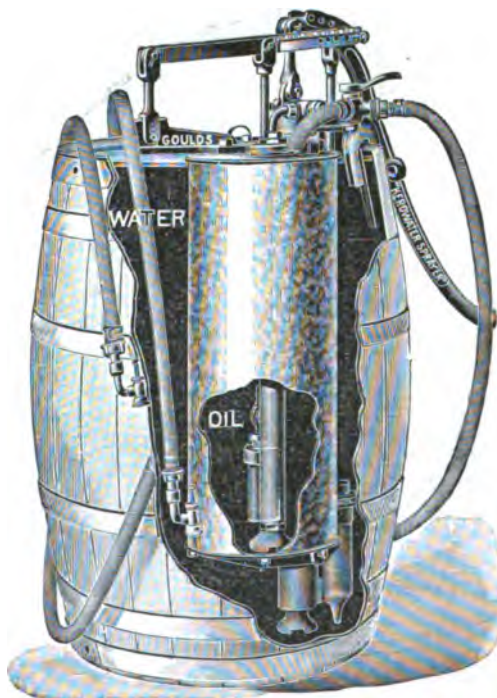


FIG. 6.—"Kerowater" pump for spraying a mixture of kerosene and water.

Extension Rods. In spraying large trees these are almost a necessity, as by means of a rod the spray may be directed to the inside of the tree, which could not be reached without it except with great loss of material.

A gallon measure made of copper is convenient but not necessary.

A strainer of some sort is always needed to remove coarse particles of lime, etc. Straining through burlap is tedious and expensive.

A large copper funnel with a wire gauze strainer is better than burlap. Hoses, nozzles, strainers, rods, etc., may be purchased of firms furnishing spray pumps.

Specific Directions.

The enumeration of the different species of insects and diseases which attack even our common fruits and vegetables can not be attempted in a bulletin. This would require a volume. Therefore, in conclusion, only brief notes regarding apple scab and brown rot among diseases, and the codling moth in insects will be given. Members of this Society are privileged and requested to send to this office at any time specimens of insects or diseases for identification. To insure safe arrival insects should be enclosed in a tin box or stout wooden box and leaves and twigs wrapped carefully in tissue and then in heavier paper.



FIG. 7.—Vermorel nozzle, single.

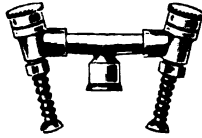


FIG. 8.—Double Vermorel.



FIG. 9.—Triple Vermorel.

FIG. 10.—Extension rod. A brass tube provided with a stop-cock and inserted within a bamboo pole.

Apple Scab.

This disease affects both foliage and fruit, appearing on the former as yellow spots which eventually spread and cause the leaves to fall prematurely. On the fruit it appears as rough brown areas, seriously injuring its keeping qualities and market value.

The spores of this disease live over winter, adhering to the buds and bark as well as the fallen leaves, germinating at the time the leaves start in the spring. It is evident then that the most important spraying for apple scab is in early spring be-

fore the buds open, that we may destroy or prevent the germination of the spores. For this spraying copper sulfate may be used dissolved in water at the rate of 2 lbs. to 50 gallons of water.



FIG. 11.—Strainer.

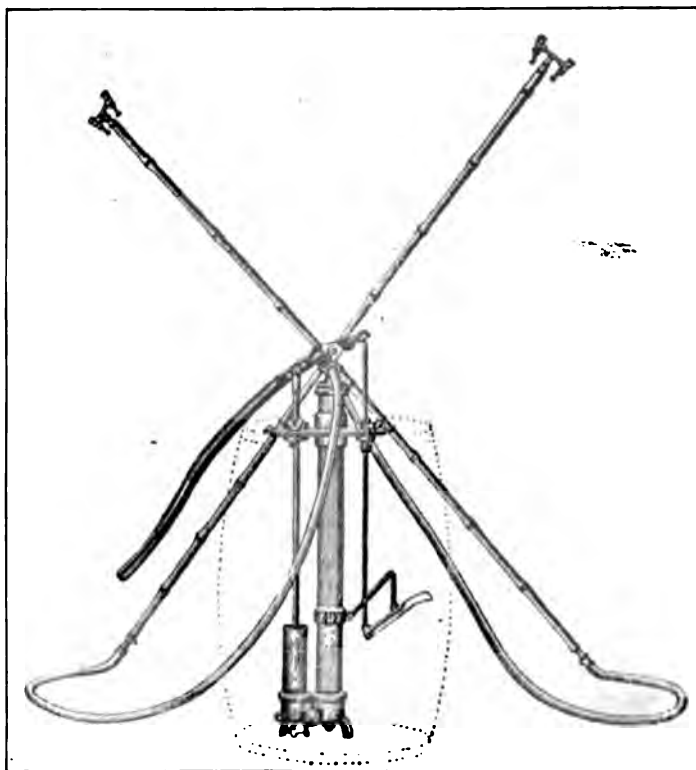


FIG. 12.—A efficient barrel pump equipped with two leads of hose, extension rods and Vermorel nozzles.

The trees should be sprayed again as soon as possible after the blossoms have fallen and a third time ten days later. Bordeaux mixture should be used for these sprayings, combined with Paris green or arsenate of lead. Do not use copper sulfate on growing trees or plants unless combined with lime.

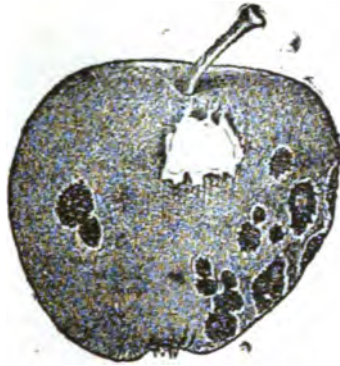


FIG. 13.—An apple affected with scab.

Plum Rot; Fruit Rot; Brown Rot.

This destructive fungus is the most provoking as well as the most destructive of plum diseases. It usually affects the ripening fruit, causing it to decay rapidly while still on the tree. The skins of the affected fruits are covered with grayish pustules or spore masses which serve to perpetuate the disease.

The spores may gain entrance very early in the season, lodging in the bud scales very early in spring and as the buds open find a congenial field in the growing tissues where they usually exist through the summer, finding their favorite feeding ground in the ripening fruit.

Occasionally, however, it does not wait so long but if the weather conditions are favorable, attacks the blossoms, causing them to decay and may thus wholly prevent the setting of fruit.

Moist, warm weather favors the progress of the disease.

It is probable that this disease may be largely if not wholly controlled by spraying. The first spraying should be done very early in the spring, before the buds open and at this time the copper sulfate solution advised for apple scab may be used. At the close of the blossoming season a thorough application of Bordeaux should be given, and again later in the season if any suspicion exists that the evil has not been overcome.

Where the plums hang on the tree so thickly as to touch, they are apt to rot, as the moisture which collects at the points of contact produces a softening of the tissues which afford an opportunity for the germs to enter. It is advisable then to thin the fruit severely before ripening time.

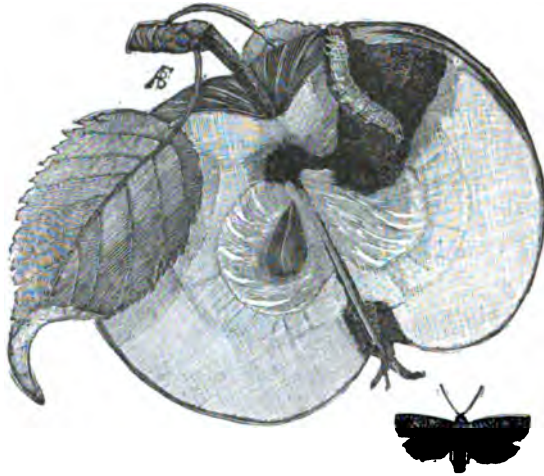


FIG. 16.—Copied from "The Spraying of plants," by Lodeman, and used by permission of the publishers, The Macmillan Co., New York.

Codling Moth. (Fig. 16.)

The mature insect, a night-flying moth, is rarely seen. The first brood of moths appears about the time the blossoms open, arising from cocoons which may be found beneath the roughened bark of old trees or more commonly in the refuse on the ground in neglected orchards. The eggs are deposited soon after the blossoms fall, on the fruit or sometimes on the leaves. The eggs hatch in seven to ten days, and the larva or "worm" finds easy entrance to the interior of the apple at the calyx or blossom end. The remainder of the story is well known; wormy apples are exceedingly common in Wisconsin.

To successfully combat this pest, which in the early stages is a caterpillar scarcely one-sixteenth of an inch long and which at once proceeds to the interior of the fruit, would seem a hopeless task and yet much may be accomplished by timely action.

For several days after the blossoms fall the immature apple retains an upright position on the stem with the calyx lobes spreading outward. This is the time to spray, and in common

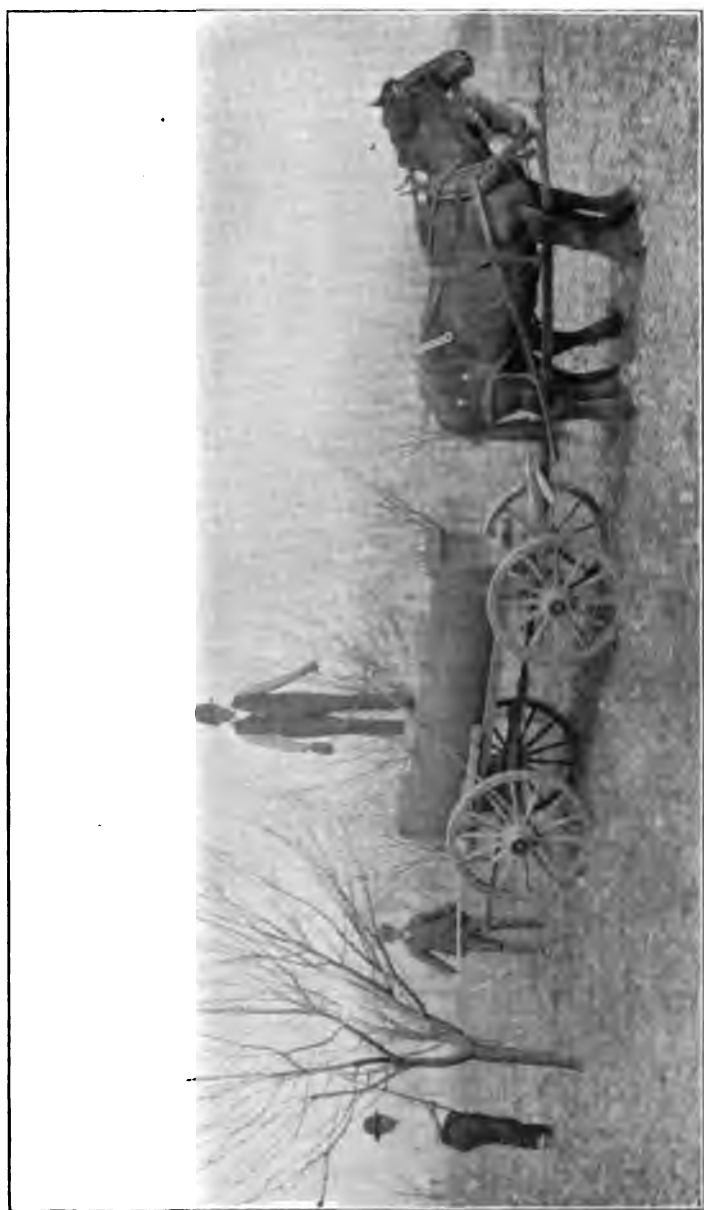
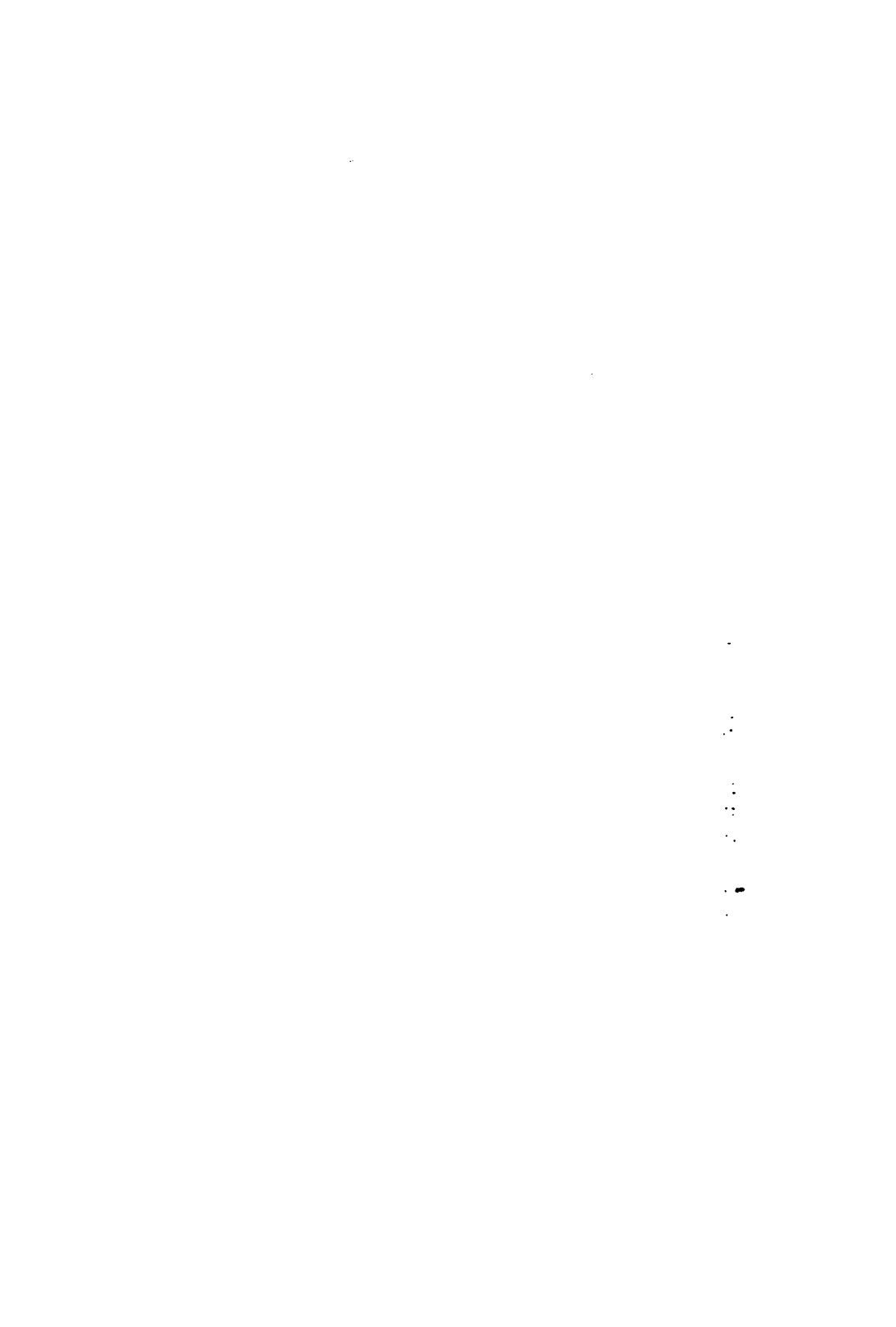


FIG. 14.—Spraying in the trial orchard at Wausau, April 27, 1904.



FIG. 15.—Third spraying at Wausau, June 22, 1904.



with practically all work of this kind must be preventive. The object to be attained in this spraying is to deposit a drop of poisoned water *in the calyx cavity* and to cover as far as possible the outside of the fruit so that the caterpillar will be obliged to eat the poison in attempting to gain entrance.

After three or four weeks the calyx lobes close and later the little apples turn downward, rendering the proper application of poisons a difficult task. For further security a second application of the poison should be made in eight or ten days, as the egg laying extends over several days.



FIG. 17.—“Just right to spray. A pear and two apples from which the petals have recently fallen. Note that the calyx lobes are widely spread.” Illustration and legend copied from Bull. 142, Cornell Univ. N. Y. M. V. Shlingerland, author.

In case of heavy rains before the calyx closes, an additional spraying may be necessary. Theoretically, the later the poison is applied, the better, if done *before the calyx closes*. Rains after this period will do but little harm as the poison is protected by a roof formed by the calyx lobes.

The course outlined above would be sufficient to completely rid our orchards of the codling moth in a short time if it were not for the

Second Brood.

Many of the caterpillars of the first brood leave the apples at maturity and sheltered by crevices in the bark or in other secure places complete their transformation to emerge in July or August as moths; these again deposit eggs which enter the fruit when near maturity. Against this brood we are helpless so far as spraying is concerned, but a partial remedy consists in trapping by banding the trees. This consists of placing bands of burlap, cotton or even hay ropes about the trunks of the trees in June or July.



FIG. 18.—“Almost too late to spray apples effectively. Note that the calyx lobes are drawn nearly together, while on the pear in the center, the calyx-cavity is open.” Illustrations and legend copied from Bull 142, Cornell Univ. N. Y. M. V. Slingerland, author.

The larvae collect beneath these, which should be removed once a week and the caterpillars or pupas destroyed. A majority of the larvae leave the apples before they fall but many remain. It is advisable, therefore, to collect and destroy all windfalls. By those two means we may in a measure prevent the ravages of the second brood and materially reduce the crop of moths which would otherwise hibernate, but in no case should spraying be neglected, and if thoroughly done in proper season there will be no second brood of moths.

Other biting insects which attack the apple are:

Canker worm and tent caterpillar.

Fortunately neither of the two named are common enough in Wisconsin to warrant an extended notice at this time; further, the spraying recommended for the codling moth is sufficient to destroy either or both of these pests as they appear early in the season.

ACKNOWLEDGMENTS.

Figs. 3, 4 and 13 are from The Principles of Plant Culture by E. S. Goff, and used by permission of the publishers, The Co-Operative Pub. Co., Madison, Wis.

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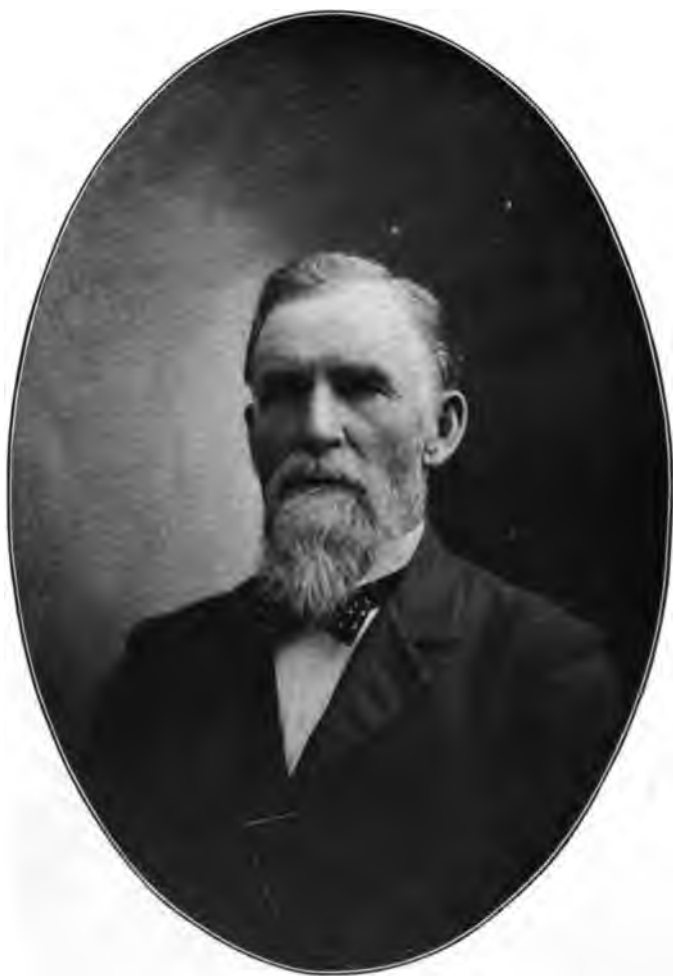
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CHARLES G. PATTEN.

ANNUAL REPORT

OF THE

Wisconsin State Horticultural
Society

FOR THE YEAR 1907

VOL. XXXVII

F. CRANEFIELD, Secretary

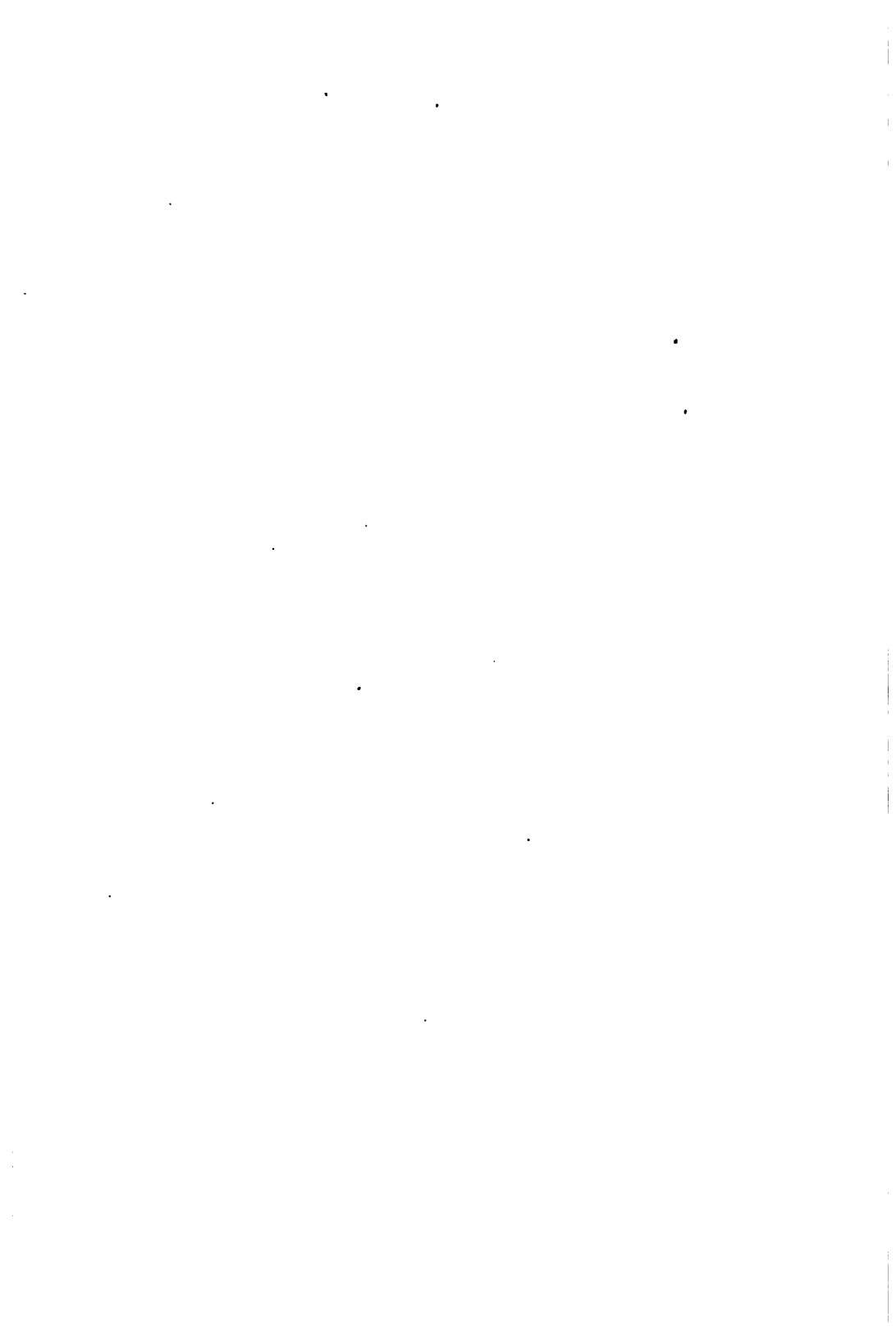
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1907.



LETTER OF TRANSMITTAL

MADISON, Wis., March 1, 1907.

TO HIS EXCELLENCY, JAMES O. DAVIDSON,
Governor of Wisconsin.

DEAR SIR:—I have the honor to transmit to you herewith the Thirty-seventh Annual Report of the Wisconsin State Horticultural Society.

Respectfully,

FREDERIC CRANFIELD,

Secretary.

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CONSTITUTION AND BY-LAWS

CONSTITUTION.

Article I. This society shall be known as the Wisconsin State Horticultural Society.

Article II. Its object shall be the advancement of the art and science of horticulture throughout the state.

Article III. Its members shall consist of annual members paying an annual fee of one dollar excepting that paid members of local societies may become members on payment of an annual fee of twenty-five cents, of life members paying a fee of five dollars. Wives of such members shall be entitled to the privileges of full membership; of honorary annual members who may by vote be invited to participate in the proceedings of the society and honorary life members who shall be distinguished for merit in horticulture and kindred sciences or who shall confer any particular benefit upon the society.

Article IV. Its officers shall consist of a President, Vice-President, Secretary, Treasurer, and an Executive Committee, consisting of the foregoing officers and additional members, one from each congressional district of the state, five of whom shall constitute a quorum at any of its meetings. All above officers, except Secretary, shall be elected by ballot, and shall hold office for one year thereafter, and until their successors are elected. The Secretary shall be appointed by the Executive Committee at the annual meeting, after the election of officers, and shall hold office for one year thereafter, or until his successor is appointed.

Article V. The members of the Executive Committee from the several congressional districts shall be chosen by the delegates of their respective county or local societies present at the annual meeting of this society, or in case of the absence of delegates from such societies or in case of failure to elect, such members shall be chosen from among the members of this society present from such districts. But if any district is not represented the vacancy shall be filled by vote of the members of this society present at the annual meeting.

Article VI. The term "County and local horticultural societies"

shall include any organization that shall have for its sole object the advancement of the interests of its members in the growing or sale of horticultural crops; provided, that such society acts by authority of a regularly adopted constitution and makes an annual report to the Secretary of the state society.

Article VII. The society shall hold its annual meeting for the election of officers, exhibition of fruits and discussions, in Madison, commencing on the first Tuesday of February of each year and such other meetings and at such time and place as the Executive Committee may direct.

Article VIII. The President, Treasurer, and Secretary shall constitute a Board of Managers which may conduct any business deemed necessary for the society in the absence of the Executive Committee. All bills against the society must be audited by the Board of Managers before being paid.

Article IX. This constitution, with the accompanying by-laws, may be amended at any regular meeting by a two-thirds vote of the members present.

BY-LAWS.

I. The President shall preside at meetings, and, with the advice of the Secretary, call all meetings of the society, and have general supervision of the affairs of the society, and shall deliver an annual address upon some subject connected with horticulture.

II. The Vice-President shall act in the absence or disability of the President, and perform the duties of the chief officer.

III. The Secretary shall attend to all the correspondence, shall record the proceedings of the society, preserve all papers belonging to the same, and superintend the publication of its reports. He shall also present a detailed report of the affairs of the society at its annual meeting. He shall also endeavor to secure reports from the various committees, and from local societies of the condition and progress of horticulture in the various districts of the state, and report the same to the society. He shall also be Superintendent of all Trial Orchards. It shall be the duty of the Secretary to make a report to the governor of the state of the transactions of the society, according to the provisions of the statutes for state reports.

IV. The Superintendent of Trial Orchards shall supervise the planting and cultivation of the trial orchards and trial stations and shall exercise general control of the same, subject to the directions of the Trial Orchard Committee.

V. The Treasurer shall keep an account of all moneys belonging to the society and disburse the same on the written order of the President, countersigned by the Secretary, and shall make an annual report of the receipts and disbursements, and furnish the Secretary with a copy of the same on or before the first day of the annual meeting. The Treasurer elect shall, before entering upon the discharge of the duties of his office, give good and sufficient bonds for the faithful performance of his duties subject to the approval of the Executive Committee.

VI. The Executive Committee may manage all the affairs of the society and fill all vacancies in the board of officers; meetings of the committee may be called by the President, the Secretary or by the Secretary on written request of five members.

VII. Regular meetings of the Board of Managers shall be held bi-monthly to audit accounts and transact other business; special meetings may be called by any member of the Board.

VIII. The standing committees of this society shall be as follows:

1st. Committee on Finance, consisting of three members.

2d. Committee on Nomenclature and New Fruits, consisting of three members.

3d. Committee on Trial Orchards and Trial Stations, consisting of three members, and such other committees as may be determined from time to time to be necessary. Said committees to be appointed annually by the President.

IX. It shall be the duty of the Finance Committee to settle with the Treasurer and to examine and report upon all bills or claims against the society which may have been presented and referred to them.

X. The Trial Orchard Committee shall have general control of the locating, planting and care of all trial orchards or trial stations, and shall visit collectively each orchard or station once each year or oftener if deemed necessary. Meetings of the committee may be called at any time by the President of the society or by the Superintendent of Trial Orchards.

MEMBERSHIP ROLL

Life Members.

A. Iis, Frank W.	Madison
Ames, W. L.	Oregon
Ayer, Ed. E.	Lake Geneva
Babcock, O. W.	Omro
Barnes, A. D.	Waupaca
Brown, F. G.	Madison
Buckstaff, D. C.	Oshkosh
Bussey, W. P.	Omro
Carpenter, L. A.	Fond du Lac
Carver, N. E.	Bayfield
Cashman, Thos. E.	Owatonna, Minn.
Chandler, S. S. Jr.	Waupaca
Chappel, F. H.	Oregon
Coe, R. J.	Ft. Atkinson
Cole, W. B.	Pleasant Prairie
Converse, D. C.	Ft. Atkinson
Davis, Prof K. C.	to; Dunn County School of Agriculture & Domestic Economy, Menomonie, Wis.
Eaton, B. A.	S. Milwaukee
Edwards, F. C.	Ft. Atkinson
Fancher, W. E.	Corliss
Fiebing, J. H.	Baraboo
Foley, M. F.	Baraboo
France, N. E.	Platteville
Freeman, Roy F.	Racine
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Guttman, A.	Manitowoc, Wis., for Manitowoc Seed Co. Manitowoc
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Hanchett, W. H.	Sparta
Harden, F. A.	Weyauwega
Harland, F. W.	Milwaukee
Harris, N. W.	Lake Geneva

Herbst, J. L.	Sparta
Hudnall, Geo. B.	Superior
Hutchinson, C. L.	Lake Geneva
Johnson, Franklin	Baraboo
Johnson, Chas. G.	Clintonville
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Jones, John D.	Elk Grove
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Kellogg, M. S.	Janesville
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Smith, Irving	Green Bay
Smith, Silas S.	Crandon
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Toole, W. A.	Baraboo
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Underwood, Roy	Lake City, Minn.
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Williams, Daniel	Oconomowoc
Wright, Arthur	Milwaukee

Honorary Life Members.

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C. G. Patten	Charles City, Iowa
Jonathan Periam	Chicago, Ill.
F. H. Phoenix	Delavan, Wis.
A. J. Phillips,	West Salem, Wis.
Prof. Wm. Trelease	St. Louis, Mo.

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Prof. S. B. Green.....	St. Anthony Park, Minn.
J. B. Graves	Neosho, Mo.
E. M. Griffiths	Madison
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Edward Hutchins	Fennville, Mich.
R. K. Lemon	Mitchellville, Iowa
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William McFetridge	Baraboo
Prof. A. B. Stout	Baraboo
C. H. True	Edgewood, Iowa
J. H. Turner	Hebron, Ill.

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Adams, W. H.	Eagle River
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Aznoe, John	Detroit Harbor
Baensch, Emil	Manitowoc
Baker, H. J.	Fond du Lac
Baldwin, Herbert	Mountain
Balsden, James	Lake Geneva
Barlow, Geo.	Lake Geneva
Barrett, James	Lake Geneva
Barrett, Miles	Lake Geneva
Barry, C. H.	Lake Geneva
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Bauer, Carl	Cedarburg
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Beerend, Dr. C.	Wauwatosa
Below, H. F.	Marshfield
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Bennett, Wm. F.	Norwood Park, Ill.
Bennett, A. C.	Grand Rapids
Best, Wm.	Lake Geneva
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Bodenstein, F.	Madison
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Bowman, Dr. F. F.	Madison
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Braemer, Herman L.	Woodland
Brainerd, C. P.	Boscobel
Brandenburg, O. D.	Madison
Bredael, Joseph	Green Bay
Brett, Dr. B. C.	Green Bay
Briggs, Newton	Madison
Brigham, Chas. I.	Blue Mounds
Brown, A. D.	Baraboo
Brown, A. D.	Poplar

Brown, F. M.	Madison
Brown, Preston	Madison
Brown, C. L.	Wauwatosa
Buehler, J. G.	Twin Bluffs
Burdick, C. G.	Antigo
Buntrack, Theo. T.	Embarrass
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Burrows, Geo.	Madison
Burton, Warren E.	Lake Geneva
Button, A. A.	Milwaukee
Button, Frank	Lake Geneva
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Christensen, H. C.	Oshkosh
Christensen, H. E.	Milltown
Christensen, F.	Manitowoc
Christensen, Nells	Lake Geneva
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Cleermans, Aug.	Green Bay
Conover, F. K.	Madison
Cooke, W. D.	Green Bay
Cooley, C. F.	Madison
Cooper, Hiram	Clinton
Cooper, H. O.	Montello
Cramer, S. F.	Merrimac
Crawford, M.	Shiocton
Curtis, George Jr.	Madison
Dale, C. H.	Madison
Dale, Jacob	Lake Geneva
Daub, C. H.	Green Bay
De Clerc, Chas.	Green Bay
De Guire, Geo.	Iron River
Delwicke, Ed.	Iron River
Dey, Scott S.	Wyocena
Dickenson, H. M.	Lake Geneva
Diley, J. F.	Rush Lake
Doherty, E. G.	Maple
Doherty, Mrs. Sadie	Poplar
Doty, E. P.	Janesville
Downey, W. J.	Whitewater

Drake, F. B.	Madison
Dunning, E. E.	Milwaukee
Edwards, J. T.	Medford
Edwards, A. J.	Ft. Atkinson
Elliott, Charles	Lake Geneva
Emery, L. J.	Milwaukee
Emmerton, Thomas	Bloomer
Everett, Dr. E.	Madison
Fargo, Robt.	Lake Mills
Fegie, John	Bayfield
Ferguson, T. J.	Wauwatosa
Fleming, Frank	Lake Geneva
Fleming, Chas.	Lake Geneva
Freeman, Michael	Racine
Fridd, John	Eureka
Gabriel, H.	New Glarus
Ganchow, W. C.	Bonduel
Giles, Peter	Milwaukee
Gilley, Albert	Stoughton
Goodrich, R. O.	Ripon
Green, Reuben	Ft. Atkinson
Grieling, L.	Green Bay
Hahn, H. J.	Sturgeon Bay
Hartwell, W. L.	Plover
Harper, C. L.	Madison
Harper, Dr. C. A.	Madison
Harper, Blanchard	Madison
Harris, S. L.	Medford
Harris, H. H.	Warrens
Hatch, C. A.	Richland Center
Hatch, L. M.	Chapin, Iowa
Hatch, A. L.	Sturgeon Bay
Henry, Prof. W. A.	Madison
Henry, M. E.	Oshkosh
Higgins, H. M.	Lake Geneva
Hildeman, E. S.	Belleplain
Hillier, B. S.	Madison
Hodge, W. A.	Waunakee
Hoeffs, Aug.	Shawano
Hollister, A. H.	Madison
Hopson, E. D.	Madison
Howle, John	Waunakee
Hurry, Wm.	Lake Geneva

Ihrig, J. J.	Oshkosh
Illenberger, W. H.	Lake Geneva
Irwin, R. A.	Lancaster
Isaacson, Chas.	Poplar
Isom, R. A.	Madison
Jackson, Mrs. J. A.	Madison
Jackson, Chas.	Ft. Atkinson
Jacobs, A. F.	Coloma Sta.
James, P. T.	Bloom City
Jeffrey, Geo. J.	Milwaukee
Jewett, A. J.	Sparta
Johns, Prof. R. B.	Wausau
Johnson, Geo. J.	Delavan
Johnson, P. W.	Westboro
Johnson, Axel	Lake Geneva
Jones, Geo. J.	Neenah
Kampen, H. W.	Poynette
Kauffman, H.	Marshfield
Kelley, A. N.	Mineral Point
Kellogg, Mrs. Helen N.	Janesville
Kesl, Vaclav	Cadott
Ketchum, I. P.	Madison
Kidd, Z.	Bloom City
Kieffer, M.	Fredonia
Klauber, M. S.	Madison
Klosowski, Rev. M.	Plover
Kney, Mrs. Clara	Madison
Knispel, Barney, J.	Watertown
Kolar, Frank J.	Muscoda
Krienetz, Alfred J.	Milwaukee
Kruege, H. F.	Kenosha
Kruschke, J. W.	Cranberry Center
Kuehne, Frank	Lake Geneva
Kull, Andrew	Lake Geneva
Lamp, Robt.	Madison
Lanktree, W. H.	Ashland
Larkin, Danforth	Madison
Larratt, Wm.	Lake Geneva
Larsen, Hans	Lake Geneva
Laue, A. F.	Milwaukee
Lawrence, W. I.	Sturgeon Bay
Lawrence, W. H.	Lake Geneva
Lee, Carl E.	Mason

Lenicheck, F. J.	Milwaukee
Leverich, J. W.	Sparta
Loewe, Arthur P.	Milwaukee
Long, Henry	Lake Geneva
Longland, Wm.	Lake Geneva
Loope, Eva	Eureka
Mack, S. B.	Monroe
Madison, Chris	Lake Geneva
Mason, E. L.	Hillsboro
Marken, Otis	Valders
Martin, Walter	Oshkosh
Marsh, Thomas	Waunakee
Marsh, H. F.	Antigo
Marshall, W. S.	Madison
Marshall, R. R.	Madison
Meixner, J. W.	De Forest
Melcher, Henry	Oconomowoc
Melville, James W.	Chippewa Falls
Melville, John	Green Bay
Meyer, A. J.	Racine
Millar, Fred	Lake Geneva
Mills, Genevieve	Madison
Milward, J. G.	Madison
Mische, E. T.	Madison
Mitchell, James	Lake Geneva
Moore, Wm.	Delavan
Moore, J. G.	Madison
Morefield, Clarence	Lake Geneva
Montgomery, L. E.	Reedsburg
Moseley, J. E.	Madison
Moyle, W. J.	Union Grove
Moyle, Miss M. A.	Union Grove
Muchleisen, G.	Tell
Mueller, William E.	De Forest
Muhlenkamp, Fred	Sparta
Muller, Miss E. T.	Waukesha
Myers, Albert	Lake Geneva
McCarthy, Wm.	Albion
McConnell, T. F., Jr.	Ripon
McKay, John M.	Pardeeville
McKay, W. G.	Pardeeville
McLay, Geo. R.	Janesville
Nelson, J. C.	Green Bay

Nero, William	Cedarburg
Nielson, Alex.	Lake Geneva
Niles, Theo. N.	Monroe
Nills, Raymond	Lake Geneva
Nourse, H.	Bayfield
Oakley, Mary	Madison
Obrion, Ellsworth	Auburndale
Ohlenschlager, Walter	Oconomowoc
Oleson, James P.	Ripon
Offin, J. M.	Madison
Otis, B. F.	Sturgeon Bay
Ovenden, Frank	Madison
Paige, Mrs. W. S.	Madison
Palmer, J. S.	Baraboo
Palmer, L. H.	Baraboo
Parshall, Harry	Lake Geneva
Patterson, A. C.	Janesville
Park, W. J.	Madison
Pearson, N. P.	Lake Geneva
Pearson, C. L.	Baraboo
Pederson, C. T.	Prairie Farm
Pelton, Geo.	Reedsburg
Peterson, P. A.	Poplar
Perry, Howard E.	Black River Falls
Pfefferle, S.	Appleton
Pfefferle, John	Valders
Pfeiffer, A. F.	West Bend
Philipson, C.	Oshkosh
Planta, R. F.	Oak Park, Ill.
Post, Lewis	Madison
Post, Lawrence	Mt. Horeb
Potter, A. T.	La Farge
Proudfit, A. E.	Madison
Quinn, Michael	Lake Geneva
Ramsey, Mrs. Robt.	Baraboo
Rastall, Benj.	Viola
Ray, Joseph	Madison
Read, Geo. A.	Lake Geneva
Reek, Joseph	Neenah
Reeve, Dr. J. E.	Appleton
Reinen, C. C.	Sun Prairie
Reis, John	Ithaca
Reis, Albert	Ithaca

Reinecke, H. M.	Green Bay
Rentschler, Geo.	Madison
Reupke, Albert	Lake Geneva
Richardson, C. L.	Chippewa Falls
Riegle, G. W.	Madison
Riester, E.	Chippewa Falls
Riley, Jas.	Bloom City
Roe, J. W.	Oshkosh
Rosenow, Arthur	Oconomowoc
Ryan, Sam J.	Appleton
Sampson, Robert	Lake Geneva
Sandgren, Ed.	Lake Geneva
Sandsten, Prof. E. P.	Madison
Sandegard, Chris	Lake Geneva
Sansum, David	Baraboo
Scheutte, Aug.	Manitowoc
Schlit, Peter	Lake Forest, Ill.
Schuck, John B.	Milwaukee
Shepard, Geo.	Lake Geneva
Shimp, E. R.	Delmont, S. D.
Short, Benj.	Lake Geneva
Sidney, J. A.	Poplar
Simonson, L. A.	Washburn
Sinclair, R. O.	Lady'smith
Skewes, E. B.	Union Grove
Skinner, Mrs. Lloyd	Madison
Skinner, Prof. E. B.	Madison
Slaby, Edw. G.	Madison
Smith, B. H.	Tiffany
Smith, Mrs. J. Q.	Madison
Smith, A. J.	Lake Geneva
Smith, S. L.	Oshkosh
Soblie, Jos.	Lake Geneva
Sperbeck, M. V.	Oshkosh
Sprague, Theo.	Eagle River
Spry, John	Ft. Atkinson
Stark, Frank	Randolph
Steensland, Halle	Madison
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Stout, C. F.	Westboro
Straka, Edw. E.	Kellnersville
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Sumner, Ed.	Madison
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Timms, C. J.	Ripon
Tiplady, Walter	Lake Geneva
Tiplady, John	Lake Geneva
Tittlemore, J. N.	Oshkosh
Tobey, P. J.	Corliss
Tolman, Henry	Lake Geneva
Tomkins, W. M.	Ashland
Toole, Eben	Baraboo
Topolinski, John	Lake Geneva
Torgersen, Theo.	Coon Valley
Towne, Wm.	Lake Geneva
Trettin, A. H.	Milwaukee
Trowbridge, Geo.	Lake Geneva
Tuttle, H. B.	Valley Junction
Turtle, Henry	Lake Geneva
Turnquist, August	Bayfield
Turville, Thomas	Madison
Tuve, S. O.	Fergus Falls, Minn.
Ulbricht, Edgar A.	Milwaukee
Umlauf, Rudolph	Dorchester
Updike, Rev. E. G.	Madison
Utter, Delbert	Lake Beulah
Van Loon, John	La Crosse
Vivian, Fred	Mineral Point
Wallstedt, Wm.	Lake Geneva
Wayne, Joseph	Boscobel
Whittlesey, S. N.	Cranmoor
Wilder, A. P.	Hong Kong, China
Wilkins, A. P.	Delavan
Wilkinson, Alonzo	Bayfield
Williamson, W. D.	Madison
Winding, A.	Milwaukee
Wright, Mrs. A. O.	Madison
Young, A. W.	Chippewa Falls

SHORT COURSE STUDENTS, COLLEGE OF AGRICULTURE.
UNIVERSITY OF WISCONSIN.

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Ahlers, Walter	Grafton
Anderson, Milo C.	Greenwood
Basse, Herman	Peebles
Bennett, J. H.	Mineral Point
Bradley, Frank	Somers
Bohl, Joseph	Beaver Dam
Boll, J. C.	Rosendale, Wis.
Booth, Guy	Cuba City
Burger, John H.	Rosendale, Wis.
Coldwell, John	Blue Mounds
Cherveny, Wenzel	Kewaunee
Cook, Carl	Independence, Wis.
Callicutt, Harry	Mineral Point
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Dunbar, Harold F.	River Falls
Erickson, Louis E.	Kewaunee
Empey, George	Dorchester
Fisher, Clarence J.	Omro
Frederickson, Fred	Spring Green
Le Gresley, Norris	Hillside, Wis.
Gallagher, Frank	Reedsburg, Wis.
Hansen, Ole C.	Mineral Point
Hansen, Hans	Lake Mills, Wis.
Haman, Edgar	Sheboygan
Hirsch, B.	Washburn
Holloway, John W.	Union Grove
Jacky, Gilbert	Ma'one
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Jones, Owen	Beaver Dam
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Knoke, E. O.	Shiocton, Wis.

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

SUMMER MEETING.

BARABOO, WIS., AUGUST 29th, 1906.

MORNING SESSION.

The meeting was called to order by the President, Dr. T. E. Loope, at 10:30 o'clock, in the Congregational Church.

After the invocation had been offered, the president introduced Mayor Marriott of Baraboo, who delivered an address of welcome:

ADDRESS OF MAYOR MARRIOTT.

Mr. President, Ladies and Gentlemen of the W. S. H. S.: A week ago today I heard Mayor Bert Williams of Ashland deliver an address of welcome to the visiting League of Wisconsin Municipalities. His remarks were on this order:

"Ladies and gentlemen of the Wisconsin League of Municipalities, I welcome you to our beautiful city of Ashland"—he

paused a moment then said: "Gentlemen, imagine my peculiar position. Who of you have not been called upon in your official position to welcome different societies to your municipality and of course you all give a hot air talk about the beauties and advantages of your own city. That may be all right in some cases but imagine one mayor telling about 40 or 50 different mayors that his city or municipality excels all others. I might go on and describe the fine large bay that Ashland is situated on but if I say we have the finest bay in Wisconsin, Alderman Smith of Milwaukee will arise at once and say that Milwaukee bay is far superior to Ashland in beautiful parks and places of entertainment while your bay at Ashland is nothing but a lot of ore docks and saw-mills." The mayor very handsomely paid compliments to other cities in the same way until he came to Baraboo. He said that he could brag about their beautiful rivers with their large fish and if you wandered by the streams you would see deer, bears and other wild animals appear on its banks. Then he said "before I could sit down the mayor of Baraboo would arise and say Why thats nothing, you come to Baraboo and you can not only see big fish, deer, bear and other animals but on the banks of Baraboo River you can see sea lions playing brass bands, rhinoceros bathing in the river, animals of all kinds from the jungles of India and Africa, and its no uncommon sight to see 30 to 40 elephants on our streets at a time," so like Mayor Williams of Ashland, I will welcome you to our city and not tell you we excel all the other cities, for we do not, but when our main streets are paved, our new school house finished and the Horticulturists get to work and show their handiwork on our Court House Square, we will certainly have a city to be proud of, and ladies and gentlemen I would rather be Mayor of Baraboo than any other city in the state.

I do not want to take up much of your time in "words of welcome," I cannot but compliment you on the work you are engaged in, it must be a work of pleasure as well as a work of beauty. It was a question in my thoughts as to the difference between agriculture and horticulture but I find on looking up authority that horticulture "is the most perfect method of tilling the earth so as to produce the best results whether the products are objects of utility or of beauty." I also find that horticulture declined and was almost a lost art after the fall of Rome and that it did not revive to any great extent until the 15th and 16th century and that it took no prominence in the United States until about the year 1840 and 1845. To be a horticult-



Partial view of gladiolus exhibit by John Lewis Childs, Floral Park, N. Y.
at Summer Meeting, Baraboo, 1906.



Portion of gladiolus exhibit by Vaughn's greenhouses, Chicago at Summer
Meeting, Baraboo, Aug. 29, 1906. Water lilies in foreground
from Tower Grove Park, St. Louis.

turist one must needs be an agriculturist, a botanist, a naturalist and not least a philosopher each of these sciences performing no small part of your work.

Ladies and gentlemen again I welcome you to our city and hope your visit will be a pleasure to you all as well as a profitable one to the Society you represent.

RESPONSE.

President T. E. Loope.

Mr. Mayor, Ladies and Gentlemen: I have no set speech, nor no particular line of thought in which to answer the address of your mayor, but we came here somewhat with fear and trembling, and last night as I sat with some few of our horticulturists from a distance we certainly were inspired with a great deal of fear, because we heard what we thought sounded like the roaring of the lion, the scream of the laughing hyena and the trumpeting of the big elephant, and we did not know at what time they might make a charge on us and we would be destroyed, and I for one at least, took refuge in one of the highest rooms in the hotel.

Now, we are very glad to meet with you and we hope that we will get all of you into the Horticultural Society. We believe that we are very good people, we have that conceit, and I want to say to you now, those of you who are not acquainted with the horticulturist, that they are people who have imagination in a very large degree, and it is very necessary in their business.

But there are other things that happened to strike me yesterday in passing along through the country. So far as I could observe all the way I found that the oats and wheat and barley and rye promised to fill the bins to overflowing this year. I noticed that the corn-fields, waving very gracefully along the road, promised also that more corn cribs would be needed this fall to hold all of the corn. I noticed that the barns, so far as we could observe, were bursting with hay, and that everything seemed to betoken a great deal of prosperity to the ordinary agriculturist, and that even the tobacco fields looked very promising, and as I understand the prices are ex-

traordinarily high this year, and that you are going to reap an abundant harvest in that way, and I was wondering if you were all contented and happy over the prospect; it seems to me that all Wisconsin should be; that the laborer gets the highest wages in the history of the country as a rule, and there is an unlimited demand for more labor, so that the laborer should feel that he is in good times, that everything is promising.

Coming to the horticulturist himself, I think I may fairly say that so far as my observation goes and my knowledge, that the horticulturist this year has had a successful year. The demand for berries and small fruits of all kinds has been almost unlimited, with better prices than have almost ever been obtained before; the orchards are covered fairly well with fruit and all departments of horticulture have been flourishing. There is not any department that I know of that has been a failure and the prices have been good and I suppose that the horticulturist is rich; rich, if he has the horticultural tenth sense, or whatever you are pleased to call it, that is, imaginativeness and hopefulness. And I think we have a great deal to be thankful for, and I do not think we need to go to Virginia for better prospects, nor to Missouri, nor Texas, and we do not need to go even to Canada to grow more grain or more cattle, you can grow them in Wisconsin. All that is necessary is to use the energies that you have in the development of what business you have here, and I think Wisconsin is in that sense truly blessed and that everything seems to work together for the prosperity and happiness and contentment of its people, and I believe that as a rule we are contented and happy.

I wish to say in regard to our summer meetings that we have generally made them meetings of pleasure more than of real horticultural business, and when we look about us here and see all the beautiful flowers and all the rare specimens of plants, it seems to me that this meeting must be a success. It certainly will in that line. The only thing I would deplore is that we cannot get a better local attendance, an attendance outside of our Society so that we could demonstrate to them that we are trying to do something for the happiness of the whole people.



A TANGLE OF MOONSEED.
From Seventeenth Report, Missouri Botanical Gardens.

NATIVE VINES FOR SHADE AND ORNAMENT.

W. A. Toole, Baraboo.

While our native vines have not the showy flowers of some exotic species, their beautiful foliage makes them unexcelled as shade for porches and arbors or draperies for old fences, walks or stumps, while some are additionally desirable because of flowers or fruits. They are also hardy and with few exceptions free from diseases or insect pests.

While several varieties may be bought at nurseries, some of them are not as yet generally listed, and nurseries are not always available so it is often desirable to collect them. Good nursery grown plants are preferable if they may be had, owing to their better developed root systems but to a nature lover there is much joy in rambling through the woods, seeking suitable specimens for transplanting. Collecting should be done in fall or early spring, and vines with a woody stem should be very severely pruned before planting. To be certain of a heavy growth of healthy green foliage the soil must be rich and well supplied with moisture. It is well, before planting to stir in a quantity of well rotted manure.

As a support for most porch vines I have found nothing better than wire chicken netting. Any of the vines will need tying and training during their most rapid growth to secure an even distribution of foliage.

After a vine has been established for a few years the bottom growth may become thin unless a part at least of the stems have been trimmed back to within three or four feet of the ground to force low branching.

The American ivy (*Ampelopsis quinquefolia*) is the most commonly planted of our native vines, because of the wide uses to which it may be put and the ease with which it may be collected and transplanted. The dense, dark green foliage which colors to a beautiful crimson in autumn makes it attractive wherever planted.

For porches or arbors this ivy should be planted two to three feet apart, but if to climb the side of a stone or brick wall it is better to allow more room. The stem is able to cling to stone walls and the trunks of trees by sucker like disks on the tips of tendrils and by clinging rootlets. There has been

considerable controversy as to whether there is more than one species of American Ivy, one which clings to flat surfaces and one which does not. I am sure there is but one species around here at least showing, however, considerable variation in ability to cling to flat surfaces.

Where rock clinging varieties are needed, these showing this tendency quite strongly may be propagated from hard wood cuttings, taken in the fall and treated much like grape cuttings or the variety known to the trade as *A. Englemannii* may be bought at nurseries.

Some folks rather mourn that the Boston ivy (*A. veitchii*) is not hardy in Wisconsin. While both are desirable where it is possible to grow them I think our American ivy is fully as beautiful as the Japanese species and is adapted to a wider range of usefulness.

The wild grape is probably next in popularity and is the most used of any as a covering for arbors. It would be planted more if it were easily procurable. Many of those ornamenting homes owe their use to their happening to be in the right place when the house was built. The grape needs plenty of room in order to show off to advantage and is hardly suitable for small porches where it does not have a chance to spread some distance. In this city (Baraboo) there are some fine specimens of wild grape climbing large trees to a height of forty or fifty feet or more and spreading through the upper branches. The vines do not seem to injure these large trees but smaller trees would probably suffer by being smothered out with the heavy foliage of the grape.

The prairie rose (*Rose setigera*) has also, it is thought, been found as a native in this country. Its abundant late blooming flowers make it very useful, but it is probably well enough known not to need further mention.

The catbrier might be used as an ornamental but its thorny stem is objectionable and we have other vines much better suited to cultivation.

While truly vines, our honeysuckles may with the aid of a stake and some trimming be made to appear as quite attractive shrubs.

Growing wild they are generally found among underbrush in open places or brushy pastures. Here they twine their branches around those of the supporting plant until they reach the sunlight when they spread out in a tangled mass overtopping and often killing their support. In using as a shade for porches extra care is needed in training and trimming to se-



"The Virgins Bower is attractive in flowers, but the feathery seed vessels are still more beautiful." Native Clematis or Virgins Bower, *Clematis virginiana*.



Bitter sweet, *Celastrus scandens*.

cure a pleasing effect. When established the silvery green foliage is very beautiful and attractive. The honeysuckles have rather more than their share of pests being troubled with a small green caterpillar, a black aphid and mildew. The yellow flowered species (*Lonicera Sullivantii*) is the more vigorous grower and in favorable seasons the flowers in their abundance are very showy.

The purple flowered kind (*Lonicera glauca* variety *Douglasii*) has a reddish purple tube with showy yellow stamens. The flowers are very handsome and there is considerable variation in shades between different plants, some being more attractive than others. The type of this species (*L. glauca*) has greenish yellow flowers and is not at all beautiful. While very suitable as a porch shade both species of honeysuckle show to best advantage if allowed to ramble over a low support four or five feet high.

The climbing bitter sweet (*Celastrus scandens*) is commonly met with in the woods twining around some sapling and often growing to a considerable height. At times it is found growing over an old stump or brushpile if a tree is not available. This vine is rather heavy for porches though with a little care in trimming and training makes a good shade. It shows to best advantage covering the trunk of a tree or climbing a pole or wherever it may make a tall growth. The scarlet and orange fruit is rather attractive in fall and early winter and there is notable variation in the brightness of the berries and the length of time which they will hang on the vine. For this reason it is well to note the most desirable plants during the winter and dig sprouts or make root cuttings from them early in the spring.

Few people seeing the moonseed vine (*Menispermum Canadense*) growing along a fencerow or even brush would think it worthy of cultivation but given rich soil and room to grow it gives surprising results. The stem seems hardly woody, yet keeps alive over winter nearly to the tips. Severe cutting back in spring induces a heavy growth of very large leaves. On one place in Baraboo it is allowed to climb up a water spout, being cut to the ground every fall and each summer making a rapid growth of from twelve to fifteen feet.

The virgins bower (*Clematis Virginiana*) is attractive enough in flower to make it desirable but the feathery seed vessels are still more beautiful. It is of more airy growth than those thus far described and makes a good porch shade or does well trained to a post or trunk of a tree. If trained

to a post or a pole, wires must be strung for it to clasp its leaf stems around or else it must be tied. While not a weak grower it will not stand crowding by other vigorously growing vines.

Clematis verticillaris or *Atragene* has a flower resembling a small *Jackmanii* but much less bright in color and blooms quite early in the spring. The blossoms are hardly highly colored enough to be handsome, yet it is well worth growing. It may be used in much the same way as the *Virgins bower*.

The aforementioned vines all have perennial stems, the following are herbaceous. The wild morning glory or bindweed (*Convolvulus*) seems too much of a weed to really be useful as an ornamental, however its closely shingling leaves and light pink or occasionally white flowers make it desirable. As often seen it is displayed from the slender support of a corn-stalk where its beauty is decidedly wasted. I have only observed it once used as a porch shade. In this case plants were put about six inches apart and allowed to run up strings or wires making a very ornamental shade. It is a perennial and in our fields is troublesome, spreading by underground stems, but I think it may easily be confined under cultivation.

The wild cucumber (*Echinocystis lobata*) is an annual found wild along damp places next to streams, climbing over shrubs or underbrush. It is sometimes used as a porch vine, but is much more handsome where it has a solid backing as over brush piles, or stumps. An abundance of moisture and plant food are especially necessary to secure pleasing results with this vine.

The mountain fringe or climbing fumitory (*Adlumia cirrhosa*) is a biennial with delicate divided leaves and white or light pink blossoms shaped much like those of the squirrel corn. It is often cultivated and makes a pretty porch ornament but does not make a heavy enough growth for shade.

The following two kinds I have never seen under cultivation but I am sure they are well worth growing. The wild yam (*Dioscorea villosa*) has light green heart shaped leaves and inconspicuous flowers. The strings of peculiar three winged seed vessels make it noticeable in fall and winter.

Apios tuberosa or wild bean is listed in catalogs though I have never seen it grown. Its leaves resemble those of the wistaria in shape and color but smaller in size. The flowers which are somewhat bean shaped and borne in clusters are of a chocolate brown color and possess a delightful violet



Fig. A—American ivy, *Ampelopsis quinquefolia*, on bluffs at Devils Lake, Wla., showing that the native *Ampelopsis* sometimes develops adhesive disks for clinging.



Fig. B—Portion of vine shown in Fig. A.

like fragrance. It is found in rich moist woods climbing over underbrush.

The vines named have been found growing as natives within a few miles of Baraboo. There may be some others unknown to me found in other parts of the state.

DISCUSSION.

A Lady—I would like to ask if there is anything we can do for mildew on the honeysuckle?

Mr. Toole—I presume some of the fungicides can be used; I have never tried them, I do not know whether it might be checked or not.

Prof. Sandsten—We have had considerable trouble with mildew on the honeysuckle and other shrubs, and by using either ammonical or copper carbonate or bordeaux mixture we can control it, but in order to control it satisfactorily the bushes should be sprayed in the spring before the foliage comes out. In that case you can spray with copper sulphate alone, at the rate of four pounds of copper sulphate to 50 gallons of water. But if the mildew comes on the foliage after all, you will have to use lime in connection with the copper sulphate.

CULTIVATION OF NATIVE FERNS.

William Toole, Baraboo.

For success with outdoor ferns a reasonably favorable place is necessary. They are mostly lovers of shady sheltered places and do not bear crowding with other plants although often seeking shelter of closely overhanging foliage. It is true that they will sometimes live and thrive in exposed places if not crowded with weeds and grass but exposure to wind and sun gives a stiffness of outline which for instance we may notice in the lady fern so different from the gracefully curved fronds of the same species, grown amidst congenial surroundings.

The student in plant ecology would be interested to note the difference in growth of the *Woodsia ilvensis* as found in its usual habitat on some exposed rock and afterwards transplanted to a sheltered place where it assumes much of the smoother texture of its near relative *Woodsia obtusa*.

In shade of the dwelling house is generally chosen for the fernery and a corner open to the northeast is an ideal location for a small collection. If the north side of a building must be chosen it is well if the sweep of winds may be broken with some shrubbery. The shrub border often furnishes a favorable location for ferns. On Fourth Avenue in the city of Baraboo may be seen a fine bed of lady fern on the open lawn where there is a moderate shade of trees. Those having extensive grounds and a corresponding love of ferns could afford extra trouble to supply suitable conditions. A fair amount of humus should be in the soil of the bed and this may best be had from the coarse fibrous leaf mould to be found in the surface soil of any shady woods.

Soon will be experienced in the towns the annual nuisance of smoky fires from burning leaves gathered by those who wish to keep their lawn and sidewalks neat. If these leaves were put in some corner to decay with soil thrown over them they would yield a top-dressing for the fernery, shrub border or lawn.

In a small collection the choice for planting might be the lady fern and maiden hair as they are easily grown and may be found in almost any woods in Sauk county.

To increase the collection add the bladder ferns both the bulb bearing and the *fragilis*. These are found in more shady and rocky places than the preceding, the first two having long slender fronds if among shrubbery but both are easily grown. To these may be added the sensitive fern commonly found in grassy meadows and occasionally by shady roadsides. The fruiting fronds of the sensitive fern with those of the ostrich fern are quite ornamental with dried grasses for winter decoration.

Beautiful and interesting are the beech ferns and they are easily grown. The three evergreen shield ferns readily adapt themselves to the fernery, two of them are fairly common in shaded rocky places. With these may be grown *Woodsia obtusa* an attractive fern much after the style of the *fragilis* bladder fern but more robust. A collection of rocks is not necessary for the well doing of the kinds already mentioned but rocks arranged with good taste would make the surrounding seem more in harmony.



Asplenium thelypteroides, the Dells, Kilbourn, Wis.
All illustrations of ferns in this volume from photographs by Miss Blanchard Harper, Madison, Wis.

If we would grow the walking fern, Polypody, *Asplenium Tricheomanes*, and *Woodsia ilvensis*, we should have rocks to support them. The last mentioned kind should be in an exposed situation as it seems to need occasional dryness, being often found in close company with our native cacti. The *Asplenium Tricheomanes* should grow in pockets of soil between rocks and like walking leaf and polypody should not long suffer from dryness.

If a bold effect with large ferns is desired we may use the ostrich fern and the so-called flowering ferns, that is the cinnamon fern, clayton fern and the royal fern. The first is found only where soil is deep and full of black humus, generally near some stream or spring. The name ostrich fern is readily suggested when the nearly unfolded young fronds are seen. It increases by underground runners and needs watching to keep it in place. The cinnamon fern is commonly found in swampy places near the borders especially if not far from sandy soil.

The Royal fern thrives in tamarack and shrubby, shaded swamps where sphagnum moss abounds and at its best is worthy of its name with fronds sometimes five feet long and a like distance spread across the plant.

The Clayton fern is found in shaded hillsides or by deep road cuts, but seldom in rocky places and not often in marshy ground. The last three may well have a place for some time with the smaller kinds of ferns.

I have never planted the Moonwort fern but it seems as if it might readily adapt itself to the places where the others succeed.

The Brake fern with its long underground runners seems scarcely suitable for planting with other ferns but might well be placed in the shrub border. The different species bear removal readily through late May and early in June. Many a pleasant trip may be made when seeking for the different kinds of ferns for while we may grow many species together if they are not overcrowded yet nature compels us often to go to places long distances apart to find all of the kinds here recommended.

When collecting your ferns be provided with a long sharp trowel, plenty of large sheets of newspaper and twine. Make moderate sized bundles of the ferns wrapped in papers and lay your parcels on the side in boxes or buggy bottom. Do not attempt to plant very large ferns as young plants bear removal better. If ferns are gathered for decorative purposes they

should be packed in the same way, not carried upright or with the fronds outspread.

In our fernery we may add to the variety of the collection such flowering plants as spring up early and have soon done their flowering and completed their growth. Of these may be mentioned blood root, Hepatica, the wood anemone, dutchman's breeches, lycopodium, rattlesnake plantain and partridgeberry as suitable companions with ferns and if there is room enough Solomon seal and others might be added for it seems more natural that some other growth should accompany the ferns, but always resist the temptation to overcrowd.

It is pleasing to note that in many gardens in Baraboo some of our native ferns are grown. Near the porch of one residence on Second Avenue, we each year admire a beautiful combination of Solomon seal and the Clayton fern. A little further down the street may be seen a nice collection of the bladder fern, with maiden hair and lady fern. In the same neighborhood are to be seen a number of small collections. In the city of Madison are several enthusiastic growers of our native ferns. Near the farm home, poultry are always present and the success with ferns requires that either plants or poultry be made secure with wire netting. Weeds, grass and poultry must have no place in the fernery.

A few ferns planted in a box in early spring make a nice adornment for a shaded porch and even in the house they are desirable and so easily grown. In the winter they may be grown in the house if given a rest and a little freezing before taking indoors. *Cystopteris bulbifera* has proven very satisfactory for this purpose.

In the foregoing account of ferns it has been the aim to use only common names when possible but for identification a list of these common and botanical names is here given.

Common names.

Polypody.
Maidenhair.

Botanical names.

Polypodium vulgare.
Adiantum pedatum.
Polypodium vulgare.

Spleenworts.

Lady fern.
Walking Leaf.

Asplenium Filix foemina
Asplenium Trichomanes.
Camptosorus rhizophyllus.



Aspidium spinulosum. Kilbourn, Wis.

Beech Ferns.

Phegopteris hexagenoptera.
Phegopteris polypodioides.
Phegopteris dryopteris.

Shield ferns.

Christmas fern. *Aspidium spinulosum.*
Aspidium marginale.
Aspidium acrostichoides.

Bladder ferns.

Cystopteris bulbifera.
Cystopteris fragilis.

Onocleas.

Ostrich fern. *Onoclea Strutheropteris.*
 Sensitive fern. *Onoclea Sensibilis.*
Woodsias.
Woodsia Illivocensis.
Woodsia obtusa.

Flowering ferns.

Clayton fern. *Osmundia Claytonia.*
 Cinnamon fern. *Osmundia cinnamomea.*
 Royal fern. *Osmundia regalis.*
 Moonwort fern. *Botrychium Virginianum.*

 DISCUSSION.

Dr. Everett—I would like to ask Mr. Toole what success he has had with the ostrich fern?

Mr. Toole—If you give it a deep soil you can readily have good success with the ostrich fern. As indicated in the paper, it spreads by rhizomes, it shifts its position and I believe you have to look out and save some of the younger plants to grow from.

Dr. Everett—What is the nature of the soil in which you have your plants growing?

Mr. Toole—Ours is clay soil. Whenever we gather anything like the walking fern, or things that seem to depend altogether on leaf mold, we are sure to get a good supply along with it and tuck it in the corners and all around it and see that it is well supported with what it needs, anything that gives us humus. By humus I mean the rotted matter after it has turned black; it need not be direct from the woods, provided you have that style of soil that has a great deal of decayed vegetable matter in it.

Dr. Everett—Do you plant near bushes, or trees, or larger shade?

Mr. Toole—Well, I have planted only near the house, with the exception of under one tree, but then as I have observed, they will do well if they have fairly good shade and if they are kept away from things that will overgrow and overrun them. You need not be confined to the house, but it is well to avoid a place that has a sharp sweep of wind. If not given a fair amount of shade they will live and grow, but still seem to lose their delicacy, they seem to grow more hard and stiff.

Dr. Everett—Don't you find the need of winter protection?

Mr. Toole—Well, where you have as many trees and shrubs around as is generally the case, you do not need to give any winter protection. The dropping of the leaves around them, if you are not too neat, do not clean them up too much, will afford sufficient protection.

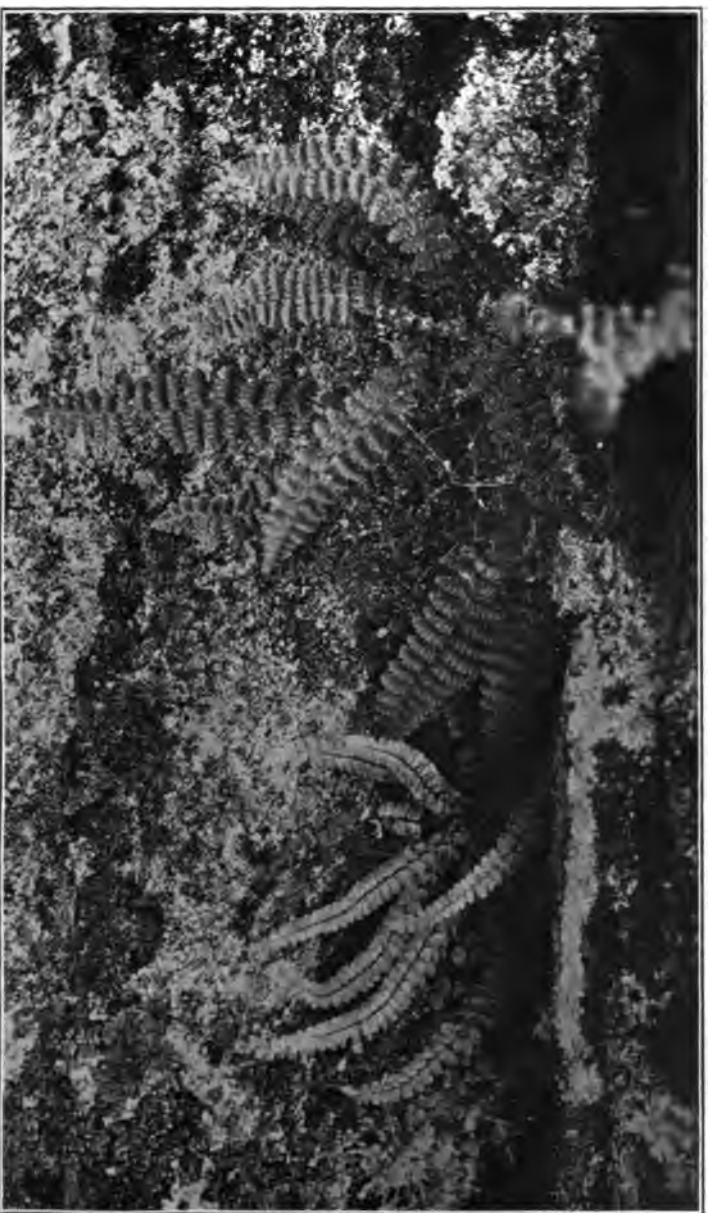
SOME NATIVE FLOWERS WORTHY OF CULTIVATION.

Dr. E. Everett, Madison.

Our native flowers are so numerous and beautiful and so large a number naturalize well, that I can mention only a few of them which will repay a moderate effort to maintain in our gardens.

I shall dwell principally upon how this can be successfully done, and thus be within the reach of any flowerlover.

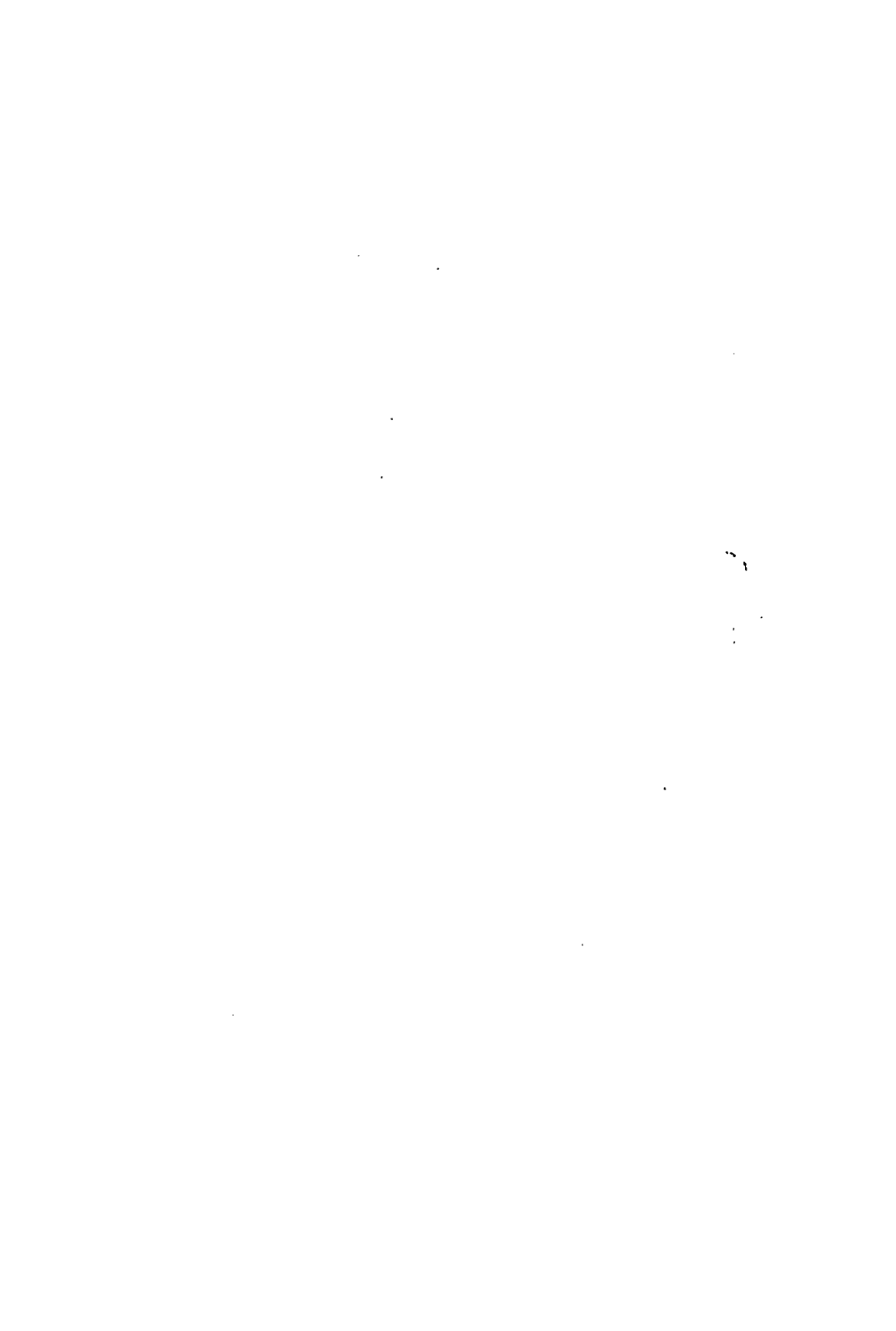
The first and main condition to keep always in mind, is to give your plant the conditions as to soil, sun, shade, and moist-



Cystopteris fragilis.

Kilbourn, Wis.

Asplenium Trichomanes.



ure, as near to its natural habitat as possible. Some plants will live anywhere and thrive more or less well, others must have certain conditions or die. The flowers growing in the open in the sun all day as on our prairies, and along the railroads have a thick matting or protection in the wild grass roots and decayed vegetation, which during the growing period and summer's heat, keeps the soil moist, loose, and highly fertilized, and also provides a great protection through our long freezing and thawing winter.

Those plants in complete or partial shade, have the yearly quantity of leaves as a protection and source of fertilization, and an atmosphere of moisture from acres of shade. Thus we observe that a winter's protection is imperative and also a summer's mulch of surface earth or other material and a loose condition of soil for root development, for the maintenance of a fine specimen plant. No watering is necessary except for plants from a moist habitat, or where you cannot give the natural shade. These must have not only moisture but a soil rich in phosphorus and potash, and of sufficient humus.

Try only those plants that the conditions of your garden or grounds will grow well. All others will be vexatious, disappointing, and a useless expenditure of time, money and strength. An expert can assimilate conditions and give suitable requirements in substitution, but he knows how to use them, and when not to try the impossible. There are plants like some people, that you cannot provide with an agreeable environment. You have to leave them alone and agree with the poet when he says:

"Full many a flower is born to blush unseen
And waste its sweetness on the desert air."

The most successful method of transplanting the majority of wild flowers, is to remove them in their dormant state at the end of their season's growth. Some, though not so many, do well if moved in the early spring when first appearing. An expert takes them at any time. With the roots remove as much soil as you can, the more the better. Never let the roots be exposed to the air after being taken up; keep the soil firmly packed about them. Prevent the plant from wilting if possible. Set out late in the afternoon shade for a few days. Reshade at the first appearance of wilting. Moisten the soil somewhat after setting out, and in a few days as the plant appears vigorous, soak the ground. The earth for newly set plants should neither be dry nor wet. A good way is to let a

pail or so of water soak away where you will set a plant, and to spread an inch of dry earth over the surface soaked.

Our most beautiful and choice wild flower seems to be of the terrestrial orchids, the *Cypripedium*, (Ladyslipper, Moccasin flower). The origin of the botanical name is from two Greek words meaning an ancient name for Venus, the Divine Mother of the Romans, and a sock or slipper—Lady Slipper. The Indians of North America called it the *Mawcahsun* or *Makkasin* Flower, resembling little Indian moccasins. This name seems most appropriate for this country, and Lady's Slipper for Europe.

I will mention a few varieties for cultivation: *C. Spectabile*, or *Reginae*, *C. Parviflorum* (small yellow), *C. Candidum*, (small white). The yellow varieties are the most successful in transplanting. I know of gardens where they have been blooming successfully over ten years. The *Spectabile* requires more of its native environment or condition. In one garden it has been growing some six years. The plants are in the full sun 1-6 P. M. The stems are not as high as in the woods, though the flowers are quite as large. But plant and bloom are very vigorous. These plants are along a vine covered porch amidst ferns, trilliums, and other wild plants, making a matted shade about 6 inches from the ground that the sunlight never penetrates and hiding the soil from view.

I am most successful in growing *Cypripedia* amongst ferns on the north side of the house. This soil is one third sandy leafmold, 1-6 two year old cow manure, 1-6 one year rooted sod, 1-3 garden soil. This is one foot deep on a clay subsoil. The variety *Spectabile* does not take kindly to transplanting. It does not seem to have the vitality of the yellow, even in its native haunts. Magnus, a German scientist, in recent investigations on the Fungus,—*Mycorrhiza*, found in the Coralroot Orchid,—*Corrallorrhiza*—says: These spores live in the fleshy roots of the Coral Orchid, and are supposed to keep the plant alive or well nourished. He and Frank also advance the idea, that the smooth and fleshy roots of this species and those of the *Cypripedium*, are thus fleshy and smooth and in a mass because they do not need the hairy filaments growing from them to secure sufficient nourishment in going far and near. Hence the principal reason these plants live but a short time when transplanted, is that the soil has not the conditions for the fungus—*Mycorrhiza*. All European botanical gardens as yet fail to produce a bog condition that the Algae will thrive in. The Bog soil is analyzed and reproduced, bogsoil is removed



Adiantum pedatum. Maidenhair fern, Kilbourn, Wis.

intact and still not the results obtained as in its native haunts. This is true of mineral waters. A chemist will analyze a water to every proportion. He will put these exact amounts or ingredients together, yet this artificial mineral water will not have the efficiency of the natural mineral water. Oftentimes it is worthless. This reminds us of what Burnis says:

"The best laid plans o' mice and men
Gang aft a-glee."

Such are the disappointments of the ambitious man. But he must keep on, allying science to his ultimate success.

One thing we notice in the haunt of the two *Cypripediums*, *Pubescens* and *Spectabile*, they are never midst underbrush, but under or near trees. Oftentimes I have seen them growing out from the earth in the crotch, where the roots of an oak leave the body of the tree, and on rotted logs, or at their sides on the ground. These plants are from seedlings and this protected situation preserves them. Our *Cypripedium* are largely dependent upon seed for their perpetuation. I used to put my Moccasin flowers under the shade of bushes, as Lilac, Syringia, Spirea, Roses, Flowering Almond, etc.* Every one of them, some two hundred, came to naught in one to three years. They were mostly planted with 6 inches of soil taken out with each plant and sent in by freight in 300 to 500 pound lots. Two heavy sods were sent from Northern Michigan containing 30 *C. Spectabile*—they died under a lilac bush. Those that are blooming vigorously are the *Pubescens* and *Spectabile* under a small elm, and amongst ferns in another location.

As in the woods the upper mass of roots must be 4 in. below the surface. In August or September put on a mulch of one year old lawngrass cuttings or decayed vegetation, old chip dirt with no sawdust in it, or rotted oak stumps. For protection during the winter, cover with rye straw 4 to 6 in. after the ground is frozen an inch or two. Remove the straw after the frost has gone from under it and there is no danger of the ground freezing again. A month later cover with an inch of cow manure two years old, covering this with one inch of sand. You will be repaid by a fine specimen of whatever has its abiding place in this retreat. The wild flowers on the north side of my house are soaked every three to five weeks, for hardly any rain comes to this spot. I find that a porch between these plants and the foundation wall of the house is conducive to a more vigorous growth, as the soil under it acts as a reservoir for moisture. While the limestone wall is always moist it

gives none back. My best blooming *C. Pubescens* this year were in the sun 9-12 A. M. The plants were very vigorous and had shorter stems, but the blooms were as large as any from the woods, and a deeper, richer, yellow, the whole flower being much thicker in texture.

The varieties of *C.* can be forced for winter blooming most successfully.

The *C. Spectabile* or *Reginae* is truly the queen of the *Cypripediums*, tall, 2-3 feet high, with its broad light-green leaves crowned by a most beautiful moccasin flower of a clear pure white and a large blotch of bright rosy carmine in its front. You need to see them growing in the open or deeper woods, moist meadows and peaty bogs, to be fully impressed by their beauty and stateliness. You admire and hesitate to remove them, again admire and revel in the sight of all that are in view. Thus you use all your spare time, and say to your long stout transplanting knife, "You Vandal, spare that plant." At last your knife is suddenly plunged into the earth 10 in. and so on, leaving only such plants as you cannot carry away with you. The *C. Candidum*, growing on boggy or peaty marshes is small and very fragrant. The *C. Parviflorum* growing with the *C. C.*, is an intergrade of the *C. Pubescens* and also is very fragrant. These two varieties also transplant very well.

Among the earliest spring flowers appear the *Hepatica Tri-loba*, white and lavender. The Bloodroot, (*Sanguinaria*), is another, pushing up its white flowers and twisting and folding them up for the night. They will grow almost anywhere, better in a shady location. These two force easily. The *Dicentra Cuccularia* (Dutchman's Breeches) are unique, and coming early are very acceptable. They will grow best in partial shade. *Dodecatheon Media* (American Cowslip, Shooting Star) resembles *Cyclamen*. It responds to cultivation quickly, and will thrive in any soil or location, but best in a rich light loam, or in deeply upturned sod. I have stems 18 in. high, the size of a lead pencil. As they die down early, they will give space to other plants. I saw a fine effect in Lincoln Park, Chicago, in a circular bed of alternate rows of Shooting Stars and the dwarf *Delphinium*. They were very large and fine and just past their zenith as the *Delphinium* came out.

The *Trillium* (Wake-Robin, Woodily Birthroot), is amongst the characteristic and beautiful flowers of our American woods. It does best in rich moist wood mold, or give them a rich soil in partial shade, but they must have a loose moist soil and



Onoclea sensibilis. Sensitive fern. Kilbourn, Wis.

planted 6 inches deep. Trilliums are amongst the relatively few plants that are very showy and yet not coarse. They should be more commonly used. They are easily forced. The *T. Grandiflorum*, is the largest flowering variety. In Michigan a monstrous form is found, some 18 in. high. *Grandiflorum* is highly prized in Europe, and is imported in quantities to those private gardens for which England is so famous.

A few dozen make a fine showing for May and June. To produce the finest flowers, they should be gathered when the buds are full grown, but not open. Cut as long stems as possible, keep at a temperature not over 60 and fully supplied with water. They will expand to a larger size than if grown in the woods. They are easily forced. Seeds will produce blooming plants in 2-3 years.

Aquilegia (wild Columbine). The exquisite variety *A. Canadensis* was transplanted from the Virginia Colony to England for the gardens of Hampton Court by a kinsman of Tradescant, gardener and herbalist to Charles I. Dancing in red and yellow petticoats to the rhythm of the breeze, along the ledge of overhanging rocks—how attractive to the bumblebee. They seem more beautiful in Nature's garden than anywhere else. They naturalize well, but needing new plants yearly, and a winter's protection. *A. Coerulea* (Rocky Mountain Columbine), blue and white is very beautiful, showy and hardy. It is worthy the best position in our rock garden, and in choice mixed borders where the soil is free and deep. It is not perennial in all soils; therefore, let some plants go to seed yearly. Columbines are most effective in separate masses, and of one kind. In partial shade in sheltered nooks this variety in California grows some 6 ft. On the mountains of Colorado shorter, but a larger flower.

Tallest and most prolific of bloom among our native lilies and the most variable in color, size, and form, is the *Lillium Superbum* (Turk's Cap, Turban Lily). Its identity is sometimes nearly merged into its Canadian Sister, *L. Canadense*. The Turk's Cap *L.* is not bell shaped at maturity like the *L. C.*, it should be open much farther, until the six points of its perianth curve so far backward as to expose the stamens for nearly their entire length. One of the purple-dotted divisions of the flower measures $2\frac{1}{2}$ -4 in. in length. These flame colored lilies are 3-7 on a stalk, but under skillful cultivation, 40 will crown a stem 9 ft. high. *L. Canadensis* is a lighter yellow, its stem is shorter, and fewer buds. These lilies naturalize most successfully. The culture of lilies is important, but the ar-

rangement and grouping are even more so. They need a rich loamy soil, with some sand and leaf mold or peat. They should be planted 6-8 in. deep. A summer's mulch of decayed lawn or other grass. Protection during the winter is imperative. Two-year old cow manure, chip dirt, or rotted oak stumps. Peat is better. These lilies are best grouped among shrubs where their brilliancy is heightened by a back-ground of green. Another effect most charming is along borders. But lilies are beautiful anywhere. Their stateliness and grace, with their brilliant and delicately colored flowers, strongly appeal to the eye, and to the imagination as well.

Liatris, (Blazing Star, Button or Snakeroot) is a hardy perennial. They respond readily to cultivation. Their handsome showy wand like spikes, 1-4 ft. high, of rose red purple flowers, are most effective amidst white and yellow, as the native *Aster*, *Golden Rod*, *Boltonia Asteroides*.

They are propagated by division in the spring, or seed in the autumn, varieties best for cultivation are the *Squarrosa*, *Scarica*, *Spicata* and *Pycnostachya*, (*Kansas Gay Feather*). They are indigenous to North America. Fifteen or more species have been found all of which will thrive in our gardens.

Other successful plants I will give a list of, *Corydalis Glauca*, biennial allied to the Dutchman's breeches with finely cut foliage of a similar character. They grow anywhere on the rocks or in rich soil, always seeding. I have them coming up variously in my garden.

Petalostemon varieties; *candidum* and *purpureum* are best known, 1-2 ft. high. They are perennials seen along railroads, and prairies.

They thrive in any soil, but are found in a loose gravelly earth. Their roots are long, many and fibrous.

Solomon's Seal, (true and false), Spring Beauties, Bellwort, Valerian. Violets, many varieties but I am very fond of the *Pedata*, *Striata*, *Viola Pubescens*, yellow (downy) *Blanda*, sweet and white, *Lanceolata*, *Baptisia*, (blue and white), Wild Geranium or cranesbill. *Tradescantia Virginica*, (spiderwort). *Anemones*; *Canadensis*, *Rue*; *Phil*; *Wood Quinquifolia*. *Lobelia syphilitica*, *Lobelia Cardinalis*, *Mertensia Virginica*, Jack in the Pulpit.

Mints: *Canadensis*, the only native mint. Mountain Mint, *Monarda Didyma* and *Fistulosa*.

Eupatorium; *Purpureum* and *Album*; Marsh Marigold.

Gentian: white and blue (closed and open). Meadow Rue, Mandrake.



Onoclea sensibilis with fruit (Sensitive fern). Kilbourn, Wis.

Sarsaprilla, Shin Leaf, Tansy, Princess Pine, Helenium Autumnale, Vervain, blue and white; Yarrow, white and pink, Spikenard, Asralia Racemosa.

Blue Flag, Iron Weed (*Veronia Novaboracens*); *Avens Trifolium*, Evening Primrose (*Oenothera Biennis*).

Aster, (Starwort, Michaelmass Daisy). There are few classes of plants that afford better material than the native aster for hybridization; it responds most readily to cultivation. There are some 200 species, about 150 of which are in America. Some species grow in the Himalayas, 15,000 feet above the sea. This aster is seen more in our gardens now that an increasing demand is abroad for native flora, especially perennials. In England particularly, have they been valued for a century or more. There is a quiet beauty about the better varieties, with their varying color, form bud and bloom. They are most decorative for cutting. They and the golden rod are the best known and appreciated of our native flowers, adding greatly to the beauty of our autumn landscapes. Every garden should have a few varieties that do not spread rapidly. I know from sad experience that some varieties will spread all over one's grounds in 2 or 3 seasons. These beautiful, vigorous perennials are generally blueish and white, and most showy in masses, planted in half neglected places, in copses and among groups of shrubs. They should not be as high as the surrounding shrubbery. Golden rod, mixed in, makes a beautiful autumn effect in the open woods, as does cosmos in the more exposed places. None of these plants require staking, care, or winter protection, and they have no diseases—most valuable considerations. By annually dividing, manuring the ground, and giving plenty of room, their blooming is longer and grander. You maintain a better bloom each succeeding year by not allowing the seed to mature. I will mention a few good varieties: A. Longifolius is most showy, growing in the pyramidal form, completely covered with bright, rose-colored flowers, until frost; B. Shortii is tall, and has large blue flowers. Ericoides, white, one of the earliest and prettiest, a great favorite in England, needs the full sun, and where the roots can penetrate deeply. Amelus, variety Bessarabicus (a Russian Starwort), one of the best and largest purple species, comes in August and September. Horizontalis, rosy lilac; Turbanallus, a soft lavender; Grandiflorus, a violet blue; Paniculata; Patens or Purple Daisy, purple blue early in August into October; Tarmicoides, white; the Novæ Rubra, bright rose colored: the Novæ Angliæ, large bluish-purple, yellow

center, is most familiar to us. Every garden should have this grand variety. This aster and Novi-Belgii are the best for pot culture, especially the latter, which gives a large flower, and a longer period of bloom. Cuttings and offshoots in the early spring make large plants by autumn; eight to twelve inch pots should be used; their chief need is quantities of water. These asters grow in a variety of soils, which can be easily observed. A most hardy perennial aster is the popular Stokes Blue, Cyannae. This variety is a native of our southern states, but in order to be appreciated it had to be reintroduced from Europe, having been known there since 1764.

Solidago. (Golden Rod). Few American wild flowers are better known than Golden Rod and Asters. They play an important part in beautifying our autumn scenes. The species is very large and is found in every variety of soil and location. You see them everywhere, even in swamps and barren stretches of sand. Beginning to bloom in July, they continue until November when most of our trees have lost their foliage. It is a gross feeder and impoverishes any good border, even exterminating valuable plants. They are best amongst shrubery or in a copse. The best varieties S. Altissima, S. Canadensis, S. Grandiflora, S. Nutans, S. Multiflora, S. Rigida, S. Sempervivens, S. Speciosa, S. Patula, S. Rigosa, S. Juncea, S. Lanceolata. I have the Canadensis and Speciosa growing 8 ft. high. They improve by transplanting.

Bryant's reference to the golden rod in his beautiful lines in the "Death of the Flowers," is particularly applicable to the latest S. to bloom, S. Petiolaris.

"The wind flower, the violet, they perished long ago.
And the wild rose and the orchis dies, amid the
summer glow;

But on the hill the golden rod, and the aster in the
wood

And the yellow sunflower by the brook, in autumn
beauty stood,

Till fell the frost from the clear cold heaven as falls
the plague on men,

And the brightness of their smile was gone, from up-
land, glade, and glen."



Asplenium marginale, Kilbourn, Wis.

DISCUSSION.

Mr. Tiplady—You have mentioned enough of the native perennials for any one to take a list from. I would like to ask you, Doctor, what you find best for a ground cover? It is very important for shrubbery and tall growing specimens of all kinds to have a ground cover of some kind, in order to cover up the bare ground, and I would like to know what is the best thing for that purpose?

Dr. Everett—I think a very pretty thing is *Corydalis*, I do not know the common name of it; it comes early and blooms all the season and it takes a hard frost to kill it. I think it is a very beautiful thing, something in the form of the *gypsophila*.

Mr. Tiplady—I would like to say for the information of the members here that for a ground cover I find that *Nepeta glechoma* and *Lysimachia nummularia* are two of the best ground covers that we have. The first mentioned is called, as a local term in England, Ground Wave, and the other one I speak of is called, locally, Creeping Jennie, and it is also of a semi-aquatic nature.

Mr. Toole—In regard to the *lysimachia*, I always advise people that they had better not get it around their grounds or lawns, unless they have something that they want to cover up, but in the ordinary garden it is an abominable weed.

Mr. Tiplady—The *lysimachia* is one of the most useful little things we have. For instance, where a drive runs along the shady side of a residence where grass will not grow, it can be used as an edging. Also in formal garden work where the beds are divided by old-fashioned stepping stones, the *lysimachia* can be used with good effect.

Mr. Moyle—I am willing to admit to the gentleman from Lake Geneva that this plant is a valuable one, yet, like Mr. Toole, I want to warn people against planting it. It is like Creeping Charley, that is the plant that you find in the back yard and everywhere. If you have a lot of rock that you want to cover, that is the thing to plant, but an ordinary man with a small garden does not want to plant the thing, because it is a terrible pest; it will cover everything, fences and stones and everything that comes along.

The President—I would like one of our friends from Lake Geneva to give us a brief history of this *Victoria Regia*; it would be interesting, I think, to the audience that do not know the plant so well.

Mr. Tiplady—The *Victoria Regia*, this wonderful giant water lily, is a specimen from the Botanical Gardens at St. Louis. Along with the specimens of the leaves we have a box of water lily flowers, two of which I find are the *Victoria Regia*. It grows wild in the Amazon River and was shown as a specialty at Kew Gardens when I was there in 1885. The leaf turned up on its edges might assume an artificial aspect, or foreign, but there is nothing artificial about that turning up of the leaf at all, that is perfectly natural, and the under side of the leaf is covered with air globules; from what examination I have made of it, they give the leaf buoyancy enough to carry a child. I saw two boards spread across the leaf at the gardens at Kew, on these two boards was a chair and on that chair was a little girl about six or eight years old.

I also noticed *Victoria Regia* growing in Lincoln Park in an outside pond artificially heated. This pond had a pipe running around it, supplying heat to the water. Of course I do not expect very many of my listeners here now will ever attempt to grow *Victoria Regia*; it is a cinch you cannot grow it in a washtub, but where these come from they can grow it; they have plenty of room and plenty of experienced help, which is necessary in growing this wonderful lily. Mr. Strombeck, of Lincoln Park, has had some seeds of the *Victoria Regia* in the tank in the greenhouse and I happened to be with him when he was examining those seeds after three years of submersion, and out of 25 or 30 seeds he found only three germinated, and others showing signs of germination, which goes to show that at least three years are necessary for the germination of the seed.

THE MISSOURI BOTANICAL GARDEN.

William Trelease, Director,
St. Louis, Mo., September 4, 1906.

Mr. Cranefield:

I am delighted to learn from your favor of the 31st, addressed to Mr. Irish, that the *Nymphaeas* and *Victorias* added to the success of your Baraboo exhibit.

I trust that your official records may show clearly that the exhibit was made by the Superintendent of Tower Grove Park, St. Louis,—adding, of course, if you wish to,—through the interest of the Missouri Botanical Garden; but I should like to make sure that the credit for the plants is placed with the Park.

Very sincerely yours,

WM. TRELEASE.

Mr. F. Cranefield, Secretary.



Woodsia ilvensis, Kilbourn, W. Va.

AFTERNOON SESSION.

ALL THE NATIVE SHRUBS WORTH PLANTING.

John Tiplady, Lake Geneva.

We can all remember the time when a native shrub was not considered worthy of cultivation for the simple reason that it grew wild along the wayside, but when we stop and examine a native specimen and sum up its real merits we are surprised to find it is equal if not superior in many respects to the foreign kinds. For many locations I prefer the native, not for its hardiness alone, its beautiful flowers, foliage, fruit and colored branches, but for its adaptability to existing conditions. For covering a steep bank where a lawn cannot be maintained what is better than the Coral Berry (*symphoricarpos vulgaris*) a native shrub possessing both upright as well as trailing branches which root at each joint thus protecting the bank against damage by heavy rains. We often see planted around railway stations and public city institutions of all kinds, foreign shrubs illy adapted to the surrounding conditions miserably existing. Our native shrubs are more used to these conditions, often being covered with dust during the dry season, twisted and shaken by heavy winds and laden down with ice and snow in winter. Yet they withstand these impositions with apparent impunity and after a favorable shower and a little sunshine continue to shower forth to the passing public the glory of their wonderful existence, proving beyond a doubt they are built of just the right kind of material to defy the heat and dust in summer as well as the ice and frost in winter. That they possess a wonderful degree of beauty and usefulness cannot be gainsaid neither can it be denied that they are now being introduced into society when we consider the fact that the leading landscape architects of this country advocate their use in a very large measure. Who would have thought twenty years ago that nurserymen would be propagating for sale thousands of *Viburnum Dentatum*, *cassinoides*, *Lentago*, *Opulus* and a host of others and yet such is the case, and I am told by reputable nurserymen that the supply is unequal to the demand. At the close of my address as a matter of discus-

sion will some member show me where the foreign shrub, all things considered, supersedes our natives. Mention one possessing two distinct features in its growth such as we find in the Coral Berry. Van Houten's spirea is gorgeous for about two weeks with its graceful flowers in countless clusters, but what is it after that? Merely ordinary autumn foliage. Figure out the number of days that a foreign shrub is especially attractive and I shall endeavor to mention a native that has its foreign rival beaten to a standstill.

For border plantations native shrubs may be selected each one possessing its own peculiar characteristics. *Cornus floridum* for instance excels and continues to bloom for two or three weeks followed by foliage of a grayish green color to a beautiful red. It is regarded as one of the most valuable for ornamental planting. Others excel in fruit such as the highbush Cranberry (*Viburnum Opulus*) which stands as a leader in the red fruited section, and justly so. Its berries color early from green to yellow by August and a fiery red by October continuing until the middle of winter it is right to consider it a leader. Others again are considered favorites for the glorious foliage effects in the symphony of autumn coloring. The champion in this class probably being *Viburnum cassinoides* (the Appalachian tea or withe rod) considered by Prof. Sargent perhaps the most beautiful of all. He praises the beauty of the thick shining leaves and the great compact rounded clusters of flowers, but the autumn coloring of its foliage is its principal feature, rivaling if not excelling the rainbow in its color effect.

Others too possess an appreciable amount of autumn colors especially that humble little shrub of the woodland "*Viburnum Acerifolium*" common known as dockmackie or maple leafed arrow-wood. It is classed among the smallest of *Viburnums* scarcely ever exceeding more than four or five feet high in the shade, but it grows somewhat taller in the open border. These two varieties with perhaps *C. floridum* added are rivals for first honors in the "free for all" race for autumn coloring and too much cannot be said in their favor. The downy leafed Arrow-wood (*V. pubescens*) comes highly commended. Mr. Manning says:

"The whole plant is covered with white flowers in early June followed later with berries of the deepest blue black. Although a native of rocky woods and thriving in a dryish soil it also does well in the open border. It forms a shapely bush and the foliage in autumn is an attractive dark color almost black."



Wild Gooseberry, *Ribes oxocanthoides*, (at right) used for facing down a row of tall shrubs and trees on the line fence. Grounds of H. H. Porter, Lake Geneva, Wis. No. 7 illustrating Native Shrubs, Tiplady.



Coral Berry, *Symphoricarpos vulgaris*, used for facing down taller shrubs on line fence. Useful for covering steep banks. Grounds of H. H. Porter, Lake Geneva, Wis. No. 8 illustrating Native Shrubs, Tiplady.

I have had prepared a few photographs showing some of the purposes to which native shrubs are available. These pictures were taken on the grounds in my charge and whereas they hardly do credit to the shrub itself the object of their being planted there is seen at a glance. Plate No. 1 shows a service road screened from residence by *Cornus stolonifera* or red osier. Number 2 shows a belt of Prickly Ash (*Zanthoxylum Americanum*) just now bearing rose colored berries packed in clusters around its branches. Plate No. 3, continuous groups of native shrubs and wild flowers taken from the lawn side, service road being entirely screened. Number 4, same group taken from service road showing residence and lawn effectually screened. Number 5 continuation of No. 4. Plate No. 6, lawn group of *Cornus paniculata*. This shrub is used extensively in shrub plantations as it adapts itself to all conditions whether the soil be wet or dry, rich or poor, the location shady or in full sunshine. Plate No. 7 shows a mass effect on property line fence, the taller shrubs being faced down by dwarfier kinds. The wild gooseberry (*Ribes oxycanthoides*) serves this purpose best as shown in the right hand corner. Plate No. 8 shows the coral berry serving the same purpose. Plate No. 9 shows a group of natives with the wild black currant on the left, the idea of this being to have the shrubs meet the grass with no intervening strip of bare ground. These pictures are taken with a view of inducing people to plan the arrangement of their home ground however small these may be and make them in pleasant weather as livable and attractive and as free from the gaze of the curious public or prying neighbor as are the rooms of the house and attractive at all times to look upon. By a careful study of these suggestions any one at a minimum cost may make their home grounds more attractive than we often see them and when we consider the fact that the time and money spent is a valuable asset to the property we cannot help but wonder why people do not take advantage of the beauties of nature more than they do. Here I find myself drifting from my subject and beg your pardon. I still wish to say a few words in praise of the common elder (*Sambucus nigra*), bordering the streams and lanes with its spreading clusters of cream-colored flowers which emit a peculiarly pleasant odor followed later with large clusters of dark berries often used for making wine. It was a common practice with boys where I was raised to cut up the fine white wood into skewers which were sold to the butchers.

Roses. In wild roses we have a number of useful varieties. *Rosa setigera* (the Michigan Prairie rose) can be seen on private estates around Lake Geneva planted in large clumps. During July it is completely covered with pinkish single blossoms that add color to its long drooping branches. Other varieties of equal beauty are *R. humilus*, *R. lucida* (from which we have a Hybrid "lucida alba"). *Rosa Carolina* of the swamps and *R. nitida* of the wayside. Native evergreen shrubs in my opinion are not so numerous however. The ground hemlock and common juniper may be used for lawn specimens but the most useful of all is the *Thuja Occidentalis* (the Arbor Vitae) used possibly more than any other as a hedge plant. When planted in good soil it makes a vigorous growth thus admitting being trimmed into any desired effect. Another good hedge plant is the common barberry (*Berberis vulgaris*) although of European origin it has become thoroughly wild in many parts of this county and being extremely hardy adds one more to our already long list of useful shrubs. The flowers emit a peculiar fragrance and the stamens possess the animate power of responding to the touch. Take the point of a tooth pick and try it on an open flower.

I give, herewith, a description of two poisonous natives for the information of those who are unable to distinguish them from harmless plants which at a casual glance they somewhat resemble. Poison Sumach (*Rhus venenata*) is a native shrub six feet high and extremely poisonous to many. Usually found growing in swamps, has light yellowish bark, dry light gray seeds in loose open clusters; whereas the harmless species grow in dry land, have dark bark, large dense conical bunches of red seed and narrow leaflets.

Poison Ivy (*Rhus Toxicodendron*) often found climbing is also very poisonous to many persons. It is often confused with the Virginia Creeper which has five leaflets while the leaves of Poison Ivy are three divided. The berries of Poison Ivy are light colored while those of the Virginia Creeper are black. Poison Ivy is reputed to be especially harmful in dull weather or at night.

I have here compiled a list of shrubs (giving the common and botanical names) best adapted to the different locations and conditions.



Wild Roses.



New Jersey Tea, a low-growing native shrub.

Native Shrubs from 6 to 12 feet high for back row of Shrub Plantations.

Common name.	Botanical name.	Remarks.
Prickly Ash	<i>Zanthoxylum Amer.</i>	Light, shade, or sun
Hoptree	<i>Ptelea trifoliata</i>	Light, shade, or sun
Winter berry	<i>Ilex verticillata</i>	Light, shade, or wet soil
Staghorn Sumac	<i>Rhus typhina</i>	Poor soil
Smooth Sumac	<i>Rhus glabra</i>	Poor soil
Shadbush	<i>Amelanchier Canadense</i>	Poor soil
Ninebark	<i>Spiraea Opulifolia</i>	Rich or poor soil
Witch Hazel	<i>Hamamelis Virginica</i>	Shade, gravelly soil
Spice bush	<i>Lindera Bendoln</i>	Wet soil
Silky Dogwood	<i>Cornus Sibirica</i>	Wet soil, light shade
Panicle Dogwood	<i>Cornus Paniculata</i>	Wet soil, White ft.
	<i>Cornus Circinata</i> and <i>Flor-</i>	
Round leaved Dogwood	<i>ida</i>	Wet soil, White ft.
Elder	<i>Sambucus nigra</i>	Wet soil, Black ft.
Cranberry tree	<i>Viburnum Opulis</i>	Wet soil, Red ft.
Arrow wood	<i>Viburnum dentatum</i>	Shade or sun black ft.
Nanny berry	<i>Viburnum Lentago</i>	Wet ground
Speckled Alder	<i>Alnus Incana</i>	Wet ground
Apalachian tree or		
Withe Rod	<i>Viburnum cassinoides</i>	Flowers and fruit light
Bladder nut	<i>Staphylea trifolia</i>	green

Medium and small native shrubs suitable for edges of Border Plantations.

Common name.	Botanical name.
Shrubby St. John's wort	<i>Hypericum prolificum</i>
New Jersey Tea	<i>Ceanothus Am.</i>
Fragrant Sumach	<i>Rhus Canadensis</i>
Dwarf cherry	<i>Prunus pumila</i>
Chokeberry	<i>Pyrus arbutifolia</i>
Dwarf June Berry	<i>Amelanchier Can.</i>
Meadow Sweet	<i>Spiraea salicifolia</i>
Steeple bush	<i>Spiraea tomentosum</i>
Wild Raspberry	<i>Rubus strigosus</i>
Flowering Raspberry	<i>Rubus odoratus</i>
Shrubby Cinquefoil	<i>Potentilla fruticosa</i>
Swamp Rose	<i>R. Carolina</i>
Dwarf Wild Rose	<i>R. Nitida</i>
Gooseberry	<i>Ribes oxycanthoides</i>

Native shrubs that will grow in light shade.

Common name.	Botanical name.
Prickly Ash	<i>Zanthoxylum Amer.</i>
Winterberry	<i>Ilex verticillata</i>
Burning bush	<i>Euonymus atropurpurea</i>
New Jersey Tea	<i>Ceanothus Americana</i>
Fragrant Sumach	<i>Rhus Canadensis</i>
Ninebark	<i>Spiraea Opulifolia</i>
Fl. Rasp	<i>Rubus occidentalis</i>
Gooseberry	<i>Ribes Floridum</i> (useful for edging as the foliage droops to ground)

Common name.	Botanical name.
Witch Hazel	<i>Hamamelis Virginica</i>
Silky Dogwood	<i>Cornus sericea</i>
Round leaved Dogwood	<i>Cornus circinata</i>
Red berried Elder	<i>Sambucus racemosa</i>
High bush Cranberry	<i>Viburnum Opulus</i>
Dockmackie	<i>Viburnum acerifolium</i>
Arrow wood	<i>Viburnum dentatum</i>
Sheepberry	<i>Viburnum Lentago</i>
Coral berry	<i>Symphoricarpus vulgaris</i>
Snow berry	<i>Symphoricarpus racemosa</i>
Bush Honeysuckle	<i>Diervilla trifida</i>
Bladder nut	<i>Staphylea trifolia</i>
Sweet pepper bush	<i>Clethra Alnifolia</i> ¹
Sweet Fern	<i>Myrica Asplenifolia</i> ²
Common Juniper	<i>Juniperus communis</i>
Ground Hemlock	<i>Taxus Canadense</i> ³

¹Wet soil, white flowers, fragrant.²Poor soil, fragrant.³Leaf mold, shade.

Native shrubs best adapted to wet ground.

Common name.	Botanical name.
Winter berry	<i>Ilex verticellata</i>
Chokeberry	<i>Pyrus Arbutifolia</i>
Shrubby Cucumber	<i>Potentilla fruticosa</i>
Dwarf Wild Rose	<i>R. lucida</i>
Wild Black Currant	<i>Ribes floridum</i>
Spice bush	<i>Lindera benzoin</i>
Red Osier Dogwood	<i>Cornus stolonifera</i>
Elder	<i>Sambucus nigra</i>
Button Bush	<i>Cephalanthus Occidentalis</i>
Swamp Blueberry	<i>Vaccinium corymbosum</i>
Sweet Fern	<i>Myrica asplenifolia</i>
High Bush Cranberry	<i>Viburnum Opulus</i>
Sweet pepper	<i>Clethra Alnifolia</i>
Bitter Sweet	<i>Solanum Dulcamara</i>
Speckled Alder	<i>Alnus Incana</i>

Native shrubs that will grow in poor or light soil.

Common name.	Botanical name.
Common Barberry	<i>Berberis vulgaris</i>
Shrubby St. John's wort	<i>Hypericum prolificum</i>
New Jersey Tea	<i>Ceanothus Americana</i>
Staghorn Sumach	<i>Rhus Typhina</i>
Smooth Sumach	<i>Rhus glabra</i>
Dwarf Cherry	<i>Prunus pumila</i>
Shadbush	<i>Amelanchier Canadensis</i>
Dwarf Wild Rose	<i>Rose nitida</i>
Witch Hazel	<i>Hamamelis Virginiana</i>
Round leaved Dogwood	<i>Cornus circinata</i>
Coral Berry	<i>Symphoricarpus vulgaris</i>
Bush Honeysuckle	<i>Diervilla Trifida</i>
Black Huckleberry	<i>Gaylussacia resinosa</i>
Sweet Fern	<i>Myrica Asplenifolia</i>
Common Juniper	<i>Juniperus communis</i>



Clump of Prickly Ash, *Zanthoxylum Americanum*, used to screen a public walk from a country home. Grounds of H. H. Porter, Lake Geneva, Wis. No. 2 illustrating Native Shrubs, Tiplady. See page 27.



Native shrubs along service road at H. H. Porter's, Lake Geneva, Wis. No. 5 illustrating Native Shrubs, Tiplady.

DISCUSSION.

Mrs. Hugh Kelly—How do you keep Jersey tea from spreading? I find when I cut off my seeds that the plant dies, and if I let the seeds dry, so many little plants come up that it gets to be a nuisance.

Mr. Tiplady—Cultivation will do that. Let the seeds fall; hoe them up when they germinate in the spring.

Mrs. Johnson—Will the sweet pepper bush and sweet fern survive the winters in this part of Wisconsin?

Mr. Tiplady—Positively live through the winter without protection, both of them. The sweet pepper bush, the *Clethra alnifolia*, grows around Lake Geneva, also around Oconomowoc; it is a good blooming and sweet scented shrub.

Mr. Toole—I would like to ask Mr. Tiplady if he has ever had any experience in transplanting the leatherwood? Out of a couple of dozen I have planted I have had one small one live. I have taken large ones and small ones and yet cannot make them live.

Mr. Sandsten—Mr. Toole the year before last sent me six of the leatherwood bushes and I had no difficulty at all in making every one of them grow.

PRACTICAL BOTANY.

Prof. A. B. Stout, Baraboo.

This paper is attempted with the understanding that the subject be presented mainly from a teacher's point of view and that it should refer chiefly to that teaching of botany in the Public Schools which pertains more or less directly to the interests of Horticulture. This in general is the interpretation to be placed upon the rather condensed topic of "Practical Botany."

In beginning we must note that as a science botany has made a remarkable advance during the past few years. The microscope with other improved means and methods of study has made known the structure and life histories of the lower forms of plant life. This has also revealed the real structure, life history and physiology of the higher plants. The un-

solved problems in botany now pertains to extension of knowledge along rather special lines. All the simpler phases of the entire plant life have been reduced to a well defined science.

So rapid has been this progress that the teaching of the subject in the schools has not kept apace. Time does not permit nor does the topic require that we should consider reasons for this. Suffice to say that the instructions of a few years ago is entirely inadequate for the needs of today.

The instruction given in the public school should impart a symmetrical knowledge of the various fields where there is application of the principles of botany. If given its due share Horticulture claims a large measure of consideration. Without any attempt to arrange a course of study let us mention some of the phases of the study.

Our lives are closely related to the production and consumption of fruits and vegetables and to the raising of ornamental plants. The life histories, the structure and physiology of higher plants must be included in the course given in our public schools. The main object of this is to treat the plant as a living organism considering such problems as requisite for germination, influence of heat, light, air, water and conditions of soil. This will involve adaptation, the struggle for existence and other phases of evolution. It is almost needless to state that these processes can best be understood when based upon a knowledge of structure. Yet the essential vegetation structures of all flowering plants is so nearly the same that a few weeks of study will give this phase adequate treatment. Morphology of Flowering Plants should be taught in secondary schools mainly for the purpose of making clear life processes. Yet the life activities of the plant is the sum total of the functions of the various parts. It is certainly practical to give such knowledge of roots, stems and leaves as will give an understanding of the plants in action. Much of this must be determined by laboratory methods hence the school room with proper equipment affords splendid opportunity for this line of study.

The various means of propagation can be taught inductively. In this connection the treatment of flowers fruit and seeds is a fertile field for study. Form and structure of flower parts were about all that earlier botanists considered. Today our interest centers in the function of those parts involving the various interrelations to insects. In nature the flower is but a means to an end and hence it should be so considered.

The floriculturist's interest rests chiefly in the flower itself and he often takes advantage of the plant to secure an abnormal growth of flower parts. But with most of our relations the real interest centers in the production of seeds and fruit. Yet in the entire field of botany there is no structure so complicated in its development and morphology as seed. In the treatment of seeds and fruit many of the more difficult problems must be omitted but general classes of fruits, weed seeds, adaptations for dispersal and other related topics can readily be handled.

Thus far we have considered the flowering plants and much of this work should be done in the grades under the head of nature study, but if instruction ceased here, much that is extremely practical would be omitted and the pupil deprived of the greatest field of botany study.

Certainly no course should be completed without a treatment of bacteria. Their great economic importance makes this imperative. Their structure, life history and importance as agents of decomposition, nitrification, can be made intelligible to High School students. Other phases of increasing interest are pathological conditions resulting from parasitic fungi. No one can practice any kind of agriculture without meeting some phase of this problem. Spot diseases in leaves and stems, fruit rots, scabby apples, plum pockets, smuts, rusts and mildews abound. While at present it does not seem to be the function of the Public School to give a complete course in fungal diseases yet it certainly seems that with other types of fungi, a rust, a smut and a mildew should be considered especially with reference to life history, injurious effects and means of control. Besides this every High School should have a representative collection of such prevalent forms as the above named. With the life history of a few types well in mind the pupil aided by talks from the teacher can become familiar with the various disease producing fungi. The smut of oats and the rusts of grains should be among the types considered. Pupils living in cities may not come in contact with some of the forms injurious to general farming and they should be especially encouraged to examine the plants of garden and lawn for presence of fungal diseases.

We have now briefly pointed out these lines of practical study relating to the field of Horticulture.

1st. Treatment of the structure and physiology of the vegetative flowering plant.

2nd. Reproduction of the plant with involved problems.

3rd. Pathological conditions resulting from parasitic fungi.

There are other phases of study that are perhaps as important which at first thought may appear less practical. It is not easy to separate the practical from that which is absolutely necessary, at least to get any sort of general agreement on that point.

The scope of botany is broad. Even the mastery of a group of plants requires a life study. Starting from the beginning it would take a student a whole year of constant study to learn the names, the general characteristics, the varying phases of life, of the trees and shrubs of this vicinity. It takes years to obtain a speaking acquaintance with all the flowering plants. In High Schools a year of work is mostly devoted to botany. An hour of study and an hour of recitation a day makes ten hours a week. Practically 36 days of steady work is devoted to botany. We can not produce botanists in that length of time.

Considering all conditions what is the most consistent treatment of the subject? To my mind it is one giving a general view of the entire field of botany through a study of prominent types, of algae, fungi, liverworts, mosses, ferns and flowering plants. Two liverworts, one moss, one fern and possibly an allied form can be thoroughly presented in four weeks time. Several important algae can be considered in a less time and the rest of the year's work can be devoted to three phases of the work as previously outlined. All this can be handled so that the subject matter is as intelligible as is the average High School work. This general treatment is most practical for various reasons. It is mainly a study of forms that have economic significance. It gives the widest acquaintance with our plant environment. It serves as a basis for further study or work either along general or special lines. Properly handled it yields first place to no subject for training in observation, comparison and inductive reasoning. Properly arranged it forms a definite science, the first natural science in the school curriculum.



Ninebark Spirea, a native shrub.

NATIVE AQUATICS.

William Longland, Lake Geneva.

In speaking of Native Aquatics which I consider worth growing the list would not be very large. I will also give a list of some of the best hardy hybrids which I know to be suitable for this State with winter protection. There are quite a number of the small perennial aquatics that are very interesting as you find them native, but would not answer as well if you were to bring them under cultivation. I will only speak of a few of these. .

We will take the *Sagittarias*. The arrow-head lily so called by the leaf resembling an arrow head of which we have several species growing locally in shallow ponds and lakes, generally found near the edge of the water, shows up well with its arrow shaped leaves and white flowers with yellow center. *Arifolia* and *cuneatum* are the most common. They bloom in July and August.

Pontederia cordata or Pickerel weed; this shows up also on the edge of streams and lakes, its leaf resembling a calla leaf. It throws up a single spike of blue flowers which as we do not find many blue hardy aquatics makes it more interesting.

Polygonum amphibium; a small floating perennial aquatic with nice showy pink flowers. We find it on ponds and lakes. It is nice for the edging of ponds.

Nymphaea tuberosa alba. It is one of our best native white pond lilies. Almost every one is familiar with it. It is to be found in most ponds and lakes and will grow almost anywhere in ponds and slow streams of water. We have a nice lot in tubs which I put into Wychwood Bay Lake Geneva four years ago. They do well and bloom right along and have no attention whatever. It blooms all summer and is fragrant.

Nymphaea advena,—yellow pond lily. This is another well known native and is generally found in company with its white neighbor and is a fit companion for it though not quite as good. It blooms all summer.

Nelumbium luteum. Our American *Nelumbo* or *Lotus* has leaves one to two feet, flowers pale yellow eight to ten inches in diameter and very fragrant. This is the grandest of our native aquatics. On August 5th I took a trip to see the *Lotus* beds at Grass Lake, Ill., about twenty miles from Lake Geneva. When we reached there we came in sight of them suddenly. I thought it the prettiest sight that I ever saw. The bed was one mass of pale yellow and green flowers standing out of the water about 18 inches and a breeze just strong enough to sway them about made a sight never to be forgotten. This bed is acres in extent and just as far as you can see, is one mass of bloom. Here, too, I found *Nymphaea alba* our sweet scented white water lily. This fringed the *Lotus* near the shore and they were as perfect as I ever saw them. Interspersed with this and the *Lotus* was *Nymphaea advena* our yellow pond lily but few and far between. Some kodak pictures that I have with me can give but a faint idea of the rare beauty of this scene as you must see it yourself to appreciate it fully.

Nelumbium speciosum; naturalized in ponds at New Jersey, was introduced in this country by Mr. E. D. Sturtevant. Color pink, the base of the petals white. The blending of the pink and white is splendid. They are very fragrant. It is a good companion for our American native variety. It needs protection in winter.

Nymphaea odorata rosea. Native in Mass. to New Jersey. Like our native white species except in color which is pink and a very free bloomer. It needs protection in winter.

I have a list of hardy pond aquatics which I will read which I know to be suitable for Wisconsin.

Hardy Aquatics for Wisconsin for use in Artificial ponds to be protected in winter.

Nymphaea. James Brydon. Flowers 5 to 6 in. in diameter. Color very rich crimson, reverse of petals silvery white. Free bloomer.

Nymphaea, *Tuberosa*, *Richardsonii*. One of the finest whites, blooms early in the morning and early evening.

Nymphaea, *Alba Gladstoniana*. The best white for our climate. The first to bloom in spring and continues to bloom until frost.

Nymphaea, Mark Hanna. Clear pink fine flower. Rather shy bloomer in cold summers like last summer. Good this summer. Fragrant.



Nelumbium luteum or American Lotus at Grass Lake, Ill.



**Grass Lake, Ill. Nelumbium luteum in background.
From photographs by Wm. Longland. Lake Geneva, Wis.**



Nymphaea, *Mary Exquisita*. Flesh color, very fragrant, good bloomer.

Nymphaea, *Odorata Caroliniana*. Robust very free bloomer, flowers 7 in. in diameter. Clear pink golden stamens reflecting a salmon tint.

Nymphaea, *Martineau Chronatella*. Clear golden yellow, blooms from spring to fall, one of the best.

Nelumbium, *Shiroman*. The enormous flowers are snow white, double, borne on strong stalks well above the leaves.

Nelumbium, *roseum*. Deep pink, fine flowers. Some people call it the red Lotus.

This is the remainder of 50 varieties tested in our locality and found to be the most serviceable.

DISCUSSION.

The Chairman—Can these be grown in tubs?

Mr. Longland—Yes, all of them have wintered out of doors, all that are on that list.

Mr. Smith—I would like to ask the gentleman how much water is necessary for the successful blooming of water lilies where they are under artificial conditions in tanks and tubs, how much water is necessary over the soil?

Mr. Longland—Well, that depends. We generally have the tubs about 18 inches deep, and the ponds will vary, some of them will run from six feet down to a foot, generally about three or four feet of water, sometimes on the small ones it is only about two feet, about eight or nine inches of water over the tubs.

Mr. Smith—How do you keep the insect life down in the water, the little fine bugs of various descriptions, how do you keep them from multiplying by the millions?

Mr. Tiplady—The insects in water lily ponds are easily kept in submission with minnows or gold fish and it is a good way and a sure way of destroying insect life in water lily ponds. The other enemy of the water lily is the mossy substance which must be taken out with a little fine minnow net.

Mr. Longland—That is the trouble that you get most with stagnant pools.

Mr. Smith—Is it necessary to draw the water off to change it?

Mr. Longland—It is necessary to run the water off a little, and do not use too cold water.

Mr. Smith—Would not the evaporation give you sufficient change?

Mr. Longland—No, the water has to be changed; keep a little stream, run it in every day.

Mr. Smith—What would be the effect if you did not change the water?

Mr. Longland—Why, it will scum over and it will be full of insects, just the same as you see a stagnant pool.

Mr. Smith—What do you do for this green, moss-like hair that gets into the pond? It grows under the water, the whole water gets full of it.

Mr. Tiplady—Fish it out with mosquito netting, as if you were catching minnows.

Mr. Longland—Where you drain your ponds every year you do not get that so much.

Mr. Toole—While the artificial ponds are drained in the winter, how do you care for the plants?

Mr. Longland—Cover them right there with the leaves and straw, draw the water off, or if you are near the lake, one of the best ways to do on some of them, plunge them right in the lake, six feet of water.

Mr. Toole—Perhaps you can tell us how a moderate sized tank is made, with cement sides and clay bottom, a wind mill and water from a well, can such a one be made successfully?

Mr. Longland—You could if your water was not too cold that was running into it, but spring water is one of the worst things for a water lily pond. The water must not be too cold.

Mr. Smith—There is another objection to water being too cold, it kills all the fish; give the fish a cold bath and it will kill them.

Mr. McFetridge—I would like to say something in defense of a vine that Mr. Toole mentions; I think he neglects to bring out the particular beauty of the blossom, that is the wild purple clematis. As he said, the blossoms of this vine are not particularly striking, but there is a certain very exquisite beauty about them, and a large number of them on a large vine I have seen in this town to give a very beautiful display. The blossoms under cultivation sometimes grow until I have seen them at least four inches in diameter and they have an exquisite beauty; the shape of the petal itself I think is worthy of mention. The vine is, by-the-way, I think, nearly extinct,

and I would like to ask Mr. Toole if he has found any of it recently and where it is found?

Mr. Toole—It is found over south on Devils Lake, and also down at the Lower Narrows.

Mr. McFetridge—Have you found it recently?

Mr. Toole—Well, not within the last two or three years, probably four or five years.

NATIVE EDIBLE FUNGI.

Mrs. J. E. English, Baraboo.

My interest in fungi dates from early childhood when in my play at our farmhouse I used to find them with delight and examine them with curious wonder. I found the answers from grown-ups very unsatisfactory in response to the many questions with which I plied them.

What child does not love the toadstools with their dainty and wonderful structure and marvelously beautiful coloring? They have the charm of mystery, coming and disappearing like magic, and with them are associated those enchanting creatures, fairies and those doubtful ones, toads.

About five years ago was the first that I was able to obtain books on Mycology or the science of fungi when I took up the study in a serious way and have found it most interesting and gratifying also for I now belong to the enthusiastic mycophagists (or fungi eaters) of the country. Our members are slowly growing. Many of my friends and neighbors eat them now who never used to consider them fit for food. Many bring them to me for identification and are content to take their knowledge at second hand and thus they miss the better part.

Since taking up this delightful study with its many appetizing rewards, I have often thought it a pity that there should be so little general information on the subject, and that good nourishing food for which we are all toiling should grow in abundance about us and go to waste for the lack of gathering. A large part of our vegetable life is of the various species of fungi. In Minn. there are 7,000 known varieties of plant life of which nearly half are fungi and I presume the propor-

tion is much the same in this State. It hardly seems possible that so few take an interest in them. From the time of Pliny, who was a contemporary of our Lord, they have been spoken of in history as one of the esteemed delicacies of the table and by many it is thought that the manna which fed the Israelites in the wilderness was a mushroom. Whether this theory is true or not it is certain that centuries ago they graced the tables of the Caesars, and today hundreds of varieties are known to be wholesome and delicious. The constant finding of new varieties keeps one absorbed and fascinated in the study. There is thorough intellectual enjoyment and many a gastronomic treat supremely satisfying as a reward of effort.

Any one who wishes to take up the study of Mycology should begin with the foundation and understand the subject thoroughly and not take it up in a superficial manner, for in this matter a little knowledge may be dangerous.

You have all probably observed that fungi are devoid of green-leaf. This indicates that the plant has no use for starch forming apparatus and so must get it already manufactured. Two methods have been adopted. In one the fungus derives its nourishment directly from a living plant upon which it grows as a parasite. The plant upon which it feeds is known as the host plant. In some instances the host plant is itself a larger variety of mushroom and it becomes so changed and absorbed by the parasite that it is impossible to identify the species of the host.

In the other method the fungus derives its prepared food from dead vegetable and animal products as dead trees and roots, leaf mold, bread, preserves, etc. The fungus sends its network of absorbing organs through the nourishing substance in every direction often for many feet or even yards. This is called the mycelium and the fungus growth which we see at the surface is the fruit or reproductive organ of the plant. Often a long period of time even years is required for the growth of the mycelium before the mushroom or fruit develops. Some, however, are of rapid growth as every housewife can testify for in hot weather bread does not have to be more than a week old before the familiar blue mold appears upon it.

Now I should like to explain to you the parts of a common mushroom so that we may talk intelligently about them. First comes a little ball pushing through the soil, as it grows upward it gradually expands into an umbrella shape. This is called the cap. The solid part of the cap is called the pileus

and the delicate under part arranged in dainty knife-like plaits is called the gills. On them are borne the spores or reproductive bodies. In identifying a variety take a mature mushroom, cut off the stem and lay it gills downward on a piece of white paper. After several hours have elapsed take it up carefully and there will be an outline of the gills in the spores which have fallen on the paper. Examine them with a microscope and note their color and shape carefully. About the stem or stipe is a delicate filmy ring. This is called the annulus. In some varieties the base of the stem is bulbous and has enveloping scales sometimes amounting to a sacklike sheath. This is called the volva.

In identifying a mushroom always examine the young specimen, one partly grown and one quite mature and be careful to gather it quite at the bottom of the stem, separate it there from the mycelium so that if there is a volva, you will surely know it. For the most poisonous of all mushrooms, the Deadly Agaric, to which nearly all deaths from mushroom poisoning are due has a volva. It is one of the *Amanita* genus of which there are five somewhat poisonous species and many edible ones that are pronounced to be very delicious, but in order to run no risk I think it wise and prudent to learn the family well and *reject it*.

To know and recognize the poisonous mushroom readily is a great safeguard. One rule I should make and that is to taste no mushroom which has a volva! This rule no doubt will debar one from some good varieties but it will surely keep one safe from the dangerous ones and leave still hosts of edible ones to choose from. Within a block of my house I gather nine different varieties of edible mushrooms that are quite common and of fine flavor.

The first to greet us in the spring as soon as the warm April showers come are the glistening *Coprinus*. They are small tan colored buttons but grow in such great clusters about old tree stumps of the elm and poplar that generous dishes of them can be gathered and they are a favorite with many. They continue to grow about every two weeks until the late frosts. By inspecting their habitat every morning one can have fine dishes of them often throughout the season. The genus *Coprinus* is easily identified. The spores are black and as they mature the gills deliquesce and drip a black inky fluid. In early days our forefathers used to gather them in this stage, boil them and strain off the juice to write their rare letters.

They are sort of a domestic plant and three very choice varieties often grow about our homes on lawns and tree banks where the soil is rich. The species just described the *atramentarius coprinus* and the *coprinus comatus* or shaggy mane is a very good one for amateurs to begin with. The three species mentioned are common. They are easily identified and they have a fine nutty flavor raw and are very delicious cooked in various ways.

The *atramentarius* is a larger species than the glistening *coprinus*. The caps often mature two inches across. The pileus is grey or slate color. The gills of a lighter shade are broad and close. The stem is usually white, hollow and short. They usually grow in clusters so closely that the caps are pressed into very irregular forms. They are so fat and solid that they always remind me of a chocolate cream. They are often found growing in potato patches in the fall.

The shaggy mane is a much more showy species. Their long cone shaped caps looks very white and stately in the green grass at a little distance. They usually grow singly and the cap does not expand until after the gills begin to deliquesce and it is unfit for use. The pileus is very shaggy whence it derives its name.

Of the genus *Agaricus* I gather two species, the *campestris* and the *abruptus*. The spores are purple. The *campestris* is the common mushroom of commerce. Three varieties of it are cultivated, all very similar. The pileus is white or brownish and the gills a beautiful pink changing to purple as the spores mature. The stem is short, stout and solid and the veil when it ruptures from the edge of the pileus forms an annulus on the stem which drops off in old age. For market they are gathered just before the veil breaks as they make no gain in weight afterwards but I consider the flavor much finer in more mature specimens.

The *abruptus* is not quite so large a mushroom and is very tender and fragile. The young pileus is a delicate buff growing brownish with age. The young gills are white and have bits of the ruptured veil clinging to them and also there are particles of it on the pileus. As they mature the gills grow purplish brown and the caps roll upward at the edges making them concave and irregular. They are a pleasant flavored mushroom and can be gathered often through our summer months. They usually spring season after season from some tree that has been cut down.



Willow-leaved Sphera, native.

No doubt you have all noticed the oyster mushroom which grows on the trunks of dead or dying trees preferring the elm or poplar here and shows white and conspicuous from quite a distance. It is called oyster because the bunches growing out from the trunk overlap one another closely and resemble oyster shells. They grow very large and look very inviting to a mycophagist for if gathered when in good condition and baked with a spring chicken mere words are inadequate, or they are delicious simply fried in butter.

Another tree mushroom which is easily identified is the sulphur polyporus. It is a great yellow mushroom as its name would indicate. The upper part is in variegated shades of orange and the pores beneath (for it has pores instead of gills) are a sulphur yellow. It grows in great irregular bunches on black oak trees. It should be gathered when young and tender. A good test is to pinch a branch and if it is soft and juicy it is in proper condition. If brittle and dry it is too old. Cut in fragments. Seasoned and stewed a short time with cream and butter added to the gravy it might easily be mistaken for chicken. I have gathered a large water bucket full from one dead black oak, which would have made a delicious dish large enough to have served thirty hungry people.

The morels are among our early mushrooms. They appear only during May and June. They may be sought in wet weather in the woods under pine and ash trees and they will repay the seeker. The cap is supported on a hollow stem and its whole surface is very uneven by reason of a network of reticulated ridges and their intervening cavities. This gives the surface a pitted or honey-combed appearance. In fact they look very much like cone-shaped sponges for they are a buff color changing to tan with age.

The ridges are blunt on the surface and the spore sacks are imbedded in the whole surface. The spores also are yellow. There are several species which are all very similar. All are wholesome and of excellent flavor. This is a good genus for amateurs to take up as they are easily identified and cannot be confused with any of the harmful kinds.

The puff balls are also an innocent family. No member of this group is injurious. They should be eaten while the interior is white or a delicate yellow. The outer skin is tough and should be removed. Then half inch slices may be dipped in beaten egg well seasoned and fried a good brown. In cooking mushrooms they should be kept covered as much as possible in order to retain the delicate flavor.

Perhaps I had better stop describing these strange fruits to you or you may not be able to carry away a clear idea with you but instead sort of a potpourri as the musicians call some of their aggravating pieces in which you no sooner recognize one tune than they break off into another.

For the past two winters we have had a small bed of *agaricus campestris* in the cellar. It is easily made and a great satisfaction. Last fall I had a section of a poplar log which was producing "oysters" carried into the cellar and we had a fine supply of the most beautiful specimens several times during the winter. They looked like bunches of the most pure and beautiful calla lillies and quite lost their resemblance to oyster shells, but the agreeable flavor remained unchanged.

I hope the little glimpse I have tried to give you into mysteries of mycology may have increased your interest in what grows about you. At least I am confident you will not make the statement a young man made a short time ago. He was a well educated and intelligent young man, too. A party of us were sightseeing and noticing a number of mushrooms I asked him if he were interested in them. "No, not much," he said. "You see there are two kinds, one kind are mushrooms and good to eat, and the other kind are toadstools and very poisonous, so you better not touch any of them. I always kick over every one I come to."

He was so happy to give me this information and remembering that

"Where ignorance is bliss
'Tis folly to be wise."

for once I held my peace.

LAWNS AND SURROUNDINGS.

Franklin Johnson, Baraboo.

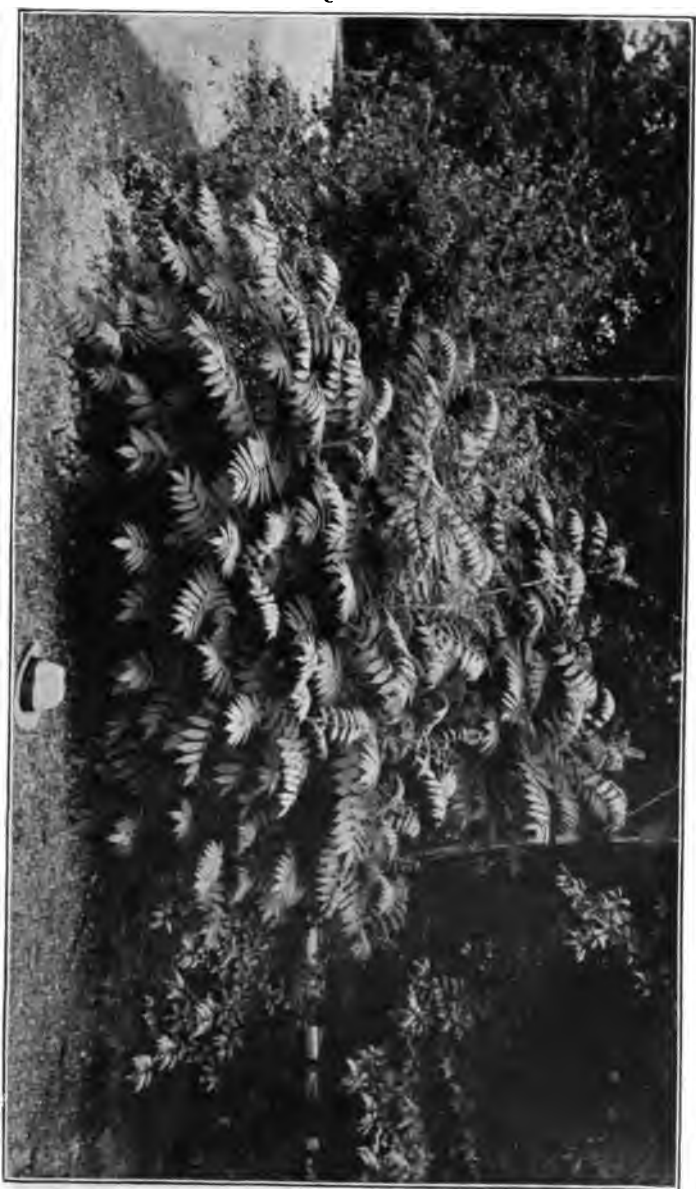
One cool morning in the fall when out looking to see what mischief Jack Frost had been doing during the night I was surprised to see a basin of water apparently free from ice. To make sure that my eyes were not deceiving me I took up the basin and gave it a little shake. The water was surely in a liquid state. Then Jack performed one of his legerdemain

tricks. Before I had time to replace the dish the water was frozen solid. The water had evidently become ice-cold and a slight jarring was all that was necessary to cause the formation of the crystals.

Some events in the social life of the community or of the nation are very like this sudden transformation of the water into ice. There was a time when the cemeteries in this country were sadly neglected. Go where you would north, south, east or west it was very much the same. Live stock roamed through the cemeteries at will. Cattle destroyed shrubs and trees and even broke down the old fashioned slab tombstones while swine rooted the graves. To many persons this state of things seemed intolerable. Magazine writers, editors, clergymen, platform lecturers and others sought to arouse public opinion against this national disgrace. Nothing seemed to have any effect until at the close of the Civil War the Grand Army of the Republic inaugurated the annual observance of Memorial day and the decoration of graves. Lo! A sudden transformation. The cemetery instead of being the most desolate and neglected spot became the one place in each community the protection and adornment of which seemed the personal interest of all. Some one has said that the founders of Memorial Day accomplished indirectly in a single year what the agitators by direct effort had failed to accomplish in a strenuous effort for forty years. This is a very superficial view of the case. Memorial Day simply crystalized the sentiment that had been formed during the long night of Agitation. It is within the province of horticultural societies to work along both the lines of agitation and crystalization. I might give many examples—one familiar to all of the settlers in Baraboo will suffice. When the old court house was first built it stood for years in the center of a lot otherwise vacant, unadorned by lawn or walk by tree or shrub or flower. The County Board refused time and again to appropriate a dollar for the embellishment of or the care of the grounds. At length the horticulturists in Baraboo took things into their own hands. They appointed a day for a "bee" and called for volunteers to fix up the court-house yard. The volunteers came with teams and tools, trees and flowers. They also brought the women folks along and had a picnic dinner. As a result of that day's labor behold the beautiful trees surrounding our court house. Those horticulturists builded better than they knew. Baraboo was not then the beautiful city which we see today but that day they crystalized the thought of what Baraboo should be. As

the result of the crystallized thought, the "Gem City" of the State. They also planted the seed which has done much to unify the County. The beauty of the old court house park developed a feeling of pride of County as shown by the practical unanimity with which the County joined in the building of the new court house. The work of Horticultural societies gives encouragement to individual effort. This brings me to the first part of my subject "The Lawn." You know the familiar receipt for cooking a rabbit which begins "First, catch the rabbit." We have the lawn. The home in Baraboo without the lawn is the exception, but some of these need improvement. With a view to encouraging the improvement of these lawns and other surroundings a year ago this last spring one of our public spirited citizens the Hon. Philip Cheek offered premiums for the best kept lawn, for the best kept back yard, for the best flower garden. The amount of each first premium was ten dollars and the amount of each second premium was five dollars. The conditions of the contest were published in our daily papers and there were about twenty entries for each offer. A list of the most glaring defects in the lawns thus entered may serve as a guide to the better way. Some were rough and uneven having never been properly graded. In others there were unsightly depressions where shrubs or trees had been removed. In some the turf was defective. Docks, dandelions, pig weeds and plantain can never be made to form the thick velvety sod that is the distinguishing feature of a good lawn. In the care of a lawn remember that a scraggy fringe never adds to its beauty but makes the whole look ragged. One of the most common mistakes is the use of too much water. Many lawns are scalded by being watered when the sun is shining. The making of a good lawn is a fine art and its care requires a high degree of intelligence. In the beautifying of home surroundings the lawn seems to be the foundation, the neatly kept back yard is the natural complement of the lawn, flowers the proper adjunct of both, vines and shrubs add their charm of beauty and trees give to all a crown of majesty.

With regard to planting I wish to call attention to one thing that is often overlooked. "The eye is not satisfied with seeing nor the ear with hearing," but an exquisite pleasure may come to the soul through the sense of smell. To a person living in Chicago the loss of this sense might be a positive blessing but to us who live simpler and saner lives the development of all of our faculties seems desirable. When darkness veils the



Stag-Horn Sumac, *Rhus typhina*, showing growth of a single season. The Sumacs tend to become bare at the base with an umbrella-like top. When used in borders the stems should be cut close to the ground each spring.

beauty of the flower from the eye then the flower asserts its loveliness by its sweet fragrance. Some of our most beautiful native trees and vines and shrubs have this desirable quality in a marked degree. Among them I would mention the thorn-apple, wild crab apple, the wild grape vine and the basswood.

This improvement of home growth is well enough in its way, but there is a lot of work about it. Does it pay? It is an admitted fact that every man's home is to a greater or less extent an expression of his character. A shrewd observer can usually tell a man's nationality by looking at his home. There is another side to this fact. These homes are not only expressions of character they are forming character. Let me give you a definition of a model citizen. The model citizen is he who has a just pride in his country, in his state, in his county, in his town, in his school district and in his home. Is it not worth time and work and money to stimulate this civic pride among the citizens of this great commonwealth?

DISCUSSION.

Mr. Hirschinger—Will you tell us how to get rid of dandelions in the lawn?

Mr. Johnson—The best way I know of to control this enemy is to sow plenty of grass and it will help to check the dandelions or anything else. Dandelions are not the worst thing in the lawn that can possibly be; in the early spring when blossoms are scarce, they look kind of cute, these dandelions sticking up; still, the fellow who has the care of the lawn never seems to think that way.

Mr. Tiplady—What grasses do you prefer as a grass mixture for a permanent lawn, what variety of grasses?

Mr. Johnson—Really, I do not know; there are so many mixtures on the market that are good.

Mr. Toole—In regard to this matter of mixture for the lawn, it reminds me that the white clover and blue grass usually will stay by you; a mixture may be desirable for the first year or two to make a quick growing close sod, but the blue grass and the white clover is what it will come to finally, the rest of the grass will disappear.

Mr. Crossman—I would like to know if the blue grass is any different in any way from our own June grass?

Mr. Toole—What we commonly speak of as blue grass or Kentucky blue grass is our ordinary June grass.

The Chairman—What would you suggest for a lawn, for the best lawn effect?

Mr. Tiplady—For quick effect, the Kentucky blue grass, red top, white clover and Rhode Island Bent. The Rhode Island Bent has to be sown often. Do not plant grass under a tree, as it will not grow under a tree.

Mr. Tiplady—What are your methods of fertilizing a lawn, annual dressing?

Mr. Johnson—I speak from observation; it always seemed to me one of the best things to use was bone dust, although common stable manure is often used and it makes an excellent lawn, applied in the fall and removed in the spring.

Mr. Tiplady—The objection I find to stable manure is that the ground must be frozen before you can drive on with the team, and the first little sunshine in the spring, a warm shower of rain that comes, softens the frozen particles, the moisture mixes with the manure and the juices of the fertilizer run down hill because they cannot enter the ground which is still frozen, so I would like to say a word in behalf of commercial fertilizers. Commercial fertilizers, especially bone dust, blood and bone and pulverized sheep manure are the best methods of fertilizing a lawn, for the simple reason that they possess the qualities necessary and they are available at all times of the year. After your lawn is thawed out in the spring and the grass commences to grow, these commercial fertilizers can be applied and they will not wash away, they will wash right in and work where we want them, so I for one advocate the commercial fertilizers.

The Chairman—About how much per acre, or quarter acre?

Mr. Tiplady—That depends on what you use. If you use blood and bone, use about 400 pounds to the acre.

Mr. Toole—Would you recommend a combination of all that you have mentioned, or would you be satisfied with the sheep manure?

Mr. Tiplady—I have much pleasure in recommending the pulverized sheep manure. It is a mechanical fertilizer in the first place, consequently I recommend that. But I have an idea that the lawn likes change, as we do, about every four or six years, and I would suggest using blood and bone a few years, just changing off to another equally good commercial fertilizer.

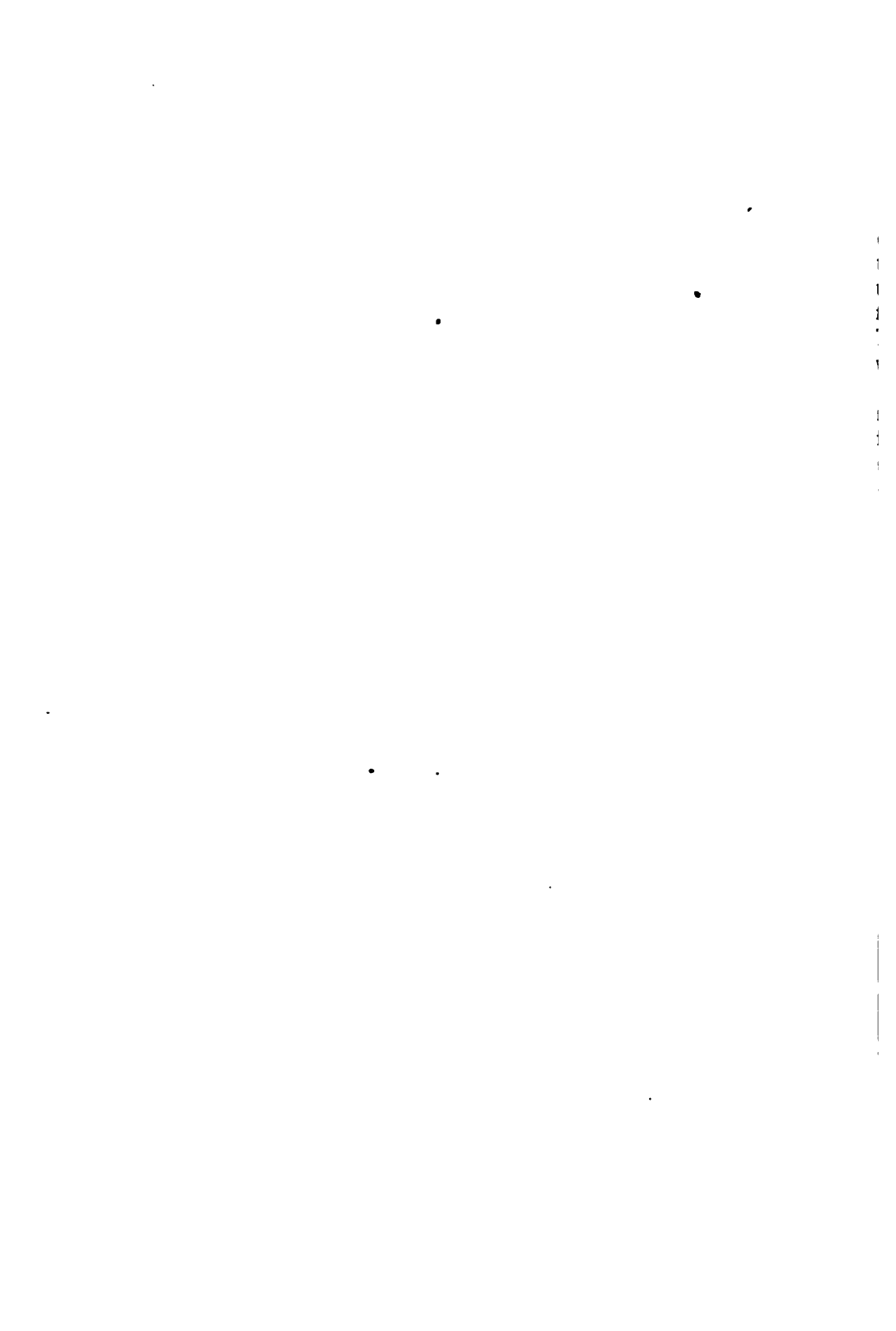
EVENING SESSION.

IDEALS IN HORTICULTURE.

Prof. E. P. Sandsten, University of Wisconsin.

It is refreshing to turn away, if for a few moments only, from the conquest and worship of the Almighty Dollar, to the contemplation of Nature and her many children. We have developed into a nation of gold worshippers and in every province of enterprise and labor the desire for wealth is so overwhelming as to silence our higher aspirations and feelings. Even horticulture, which is generally looked upon as an ideal occupation is becoming contaminated with the same evil, and so my plea to-night is not for commercialism in horticulture, but for ideals in horticulture, the same ideals that have inspired our artists and idealists, ideals which are to stand for better and happier homes and contented people. If you seek wealth for wealth's sake, turn your face from horticulture. Try politics, banking, oil, brokerage, mining, "bucket shops" or some confidence game. Horticulture will give you an honest living, a decent burial, and a sweet memory to your remaining friends. It will give you besides these, the blessings of an out-door life, health and long life. You will not have to eat crackers and milk for your morning, noon and evening meal, nor need you walk the dewy grass before breakfast for your stomach's sake. You will have no occasion to endow libraries so as not to die rich. You will not be asked to dine with kings, nor sit at the table with monkeys. Your life will be calm and serene, for it will be a life for study, surprises and rest. Your mind will not be continually rent by worries about your business, the fall and rise of stock and securities, nor will thieves be tempted to break in and steal your treasures.

That horticulture is an ideal occupation for man, as well as woman, is attested to by the fact that it was the first work given the race by the Creator, and horticulturists today are as eager as ever to eat of the tree of knowledge, a fact, which would indicate that horticulture and thinking are closely associated. There are such things as combining business with pleasure, and when this is legitimately done, we have the ideal as well as the profitable side satisfied. The signs of the times seem to indicate that horticulture in its broadest sense is be-



charity begins at home. There are millions of children and grown people in the crowded tenement houses in our large cities who have never tasted the real pleasures of out-of-door life. Crimes of all kinds and degrees flourish in the crowded cities and what else could we expect—there is nothing for the mind to do but to brood over their own conditions. Give them a chance to get acquainted with nature, with trees and flowers, and a new vista of life will suddenly be open to them. To alleviate and better conditions like these is real missionary work.

I would not have you understand that it is the city dwellers alone who neglect planting fruits and flowers. As a rule, the farmer is one of the last to provide his family with a liberal supply of fruit and flowers. It is not an uncommon sight to see farmers purchasing vegetables and fruits on the city market.

There is a great deal in the saying that we live to eat. Eating, indeed, should constitute one of the pleasures of life, and the farmer of all persons is the one who has the right to enjoy the fruits of his fields and his gardens. It is true that a large proportion of our farms have fruit trees planted on them, but this planting is often due to no special desire on the part of the farmer himself, but rather to the persistent effort of the ever present nursery agent. And for this work he is entitled to a great amount of credit.

The horticultural work on the farm is generally delegated to the women of the family, as if it did not require any hard work. It is true that gardening ordinarily requires less physical labor than general farming, but it is also true that it requires more brains, and for this reason I should judge, if for no other, it is delegated to the gentler sex. If the same amount of work were expended on an acre of orchard as is expended on an acre of corn, the profit from the orchard would be ten-fold that of the corn.

There is need of a decided awakening among farmers to the proper appreciation of things beautiful. There would be fewer young men and young women leave the farm if the farm surroundings were what they ought to be. The early impressions are the most lasting, and if the children be taught to appreciate and love flowers and trees and their nature, it would furnish a source of inspiration and knowledge, which is now so often lacking. You can hardly blame the young man for leaving the old homestead after years of hard work, without prospect for any enjoyments or home attractions. There

must be time on the farm for recreation and for the enjoyment of such pleasure as a farm can afford. The farm must offer something else than drudgery if it is going to attract and hold the future generation to the soil.

When we consider that a lily has to spin and toil, even if Solomon said that they did not, when it has its trials and tribulations, it has to search for its food, or it has to suffer for lack of water, or sunshine, or for any of the conditions which are essential or beneficial, that its suffering, though we cannot measure it, must be perhaps as keen and as great as that of an animal, I am not to argue whether they are intelligent; they may have an intelligence, although lower than ours, or lower than animals, but I want to impress you with the fact that the difference between animals and plants is not as great as we suppose it is, and the very fact that animals and plants are so closely related should encourage horticulturists and all lovers of Nature to get better acquainted with them.

CIVIC IMPROVEMENT.

E. T. Mische, Park Superintendent, Madison, Wis.

Parks and their attributes as a phase of city improvement will be the subject under discussion in the following remarks.

Every peaceful community is normally governed and regulated by laws. Under these laws it becomes the office of a communal government to not only serve the interests of the individuals composing the community by policing, constructing streets and similar necessities which become apparent at an early stage of its life but an individual may reasonably expect that the township may properly provide such means for protection and enjoyment as a wise disbursement of public funds will permit.

Granted that this premise is correct let us inquire into the needs of a city.

Parks, their related properties and recreation areas in cities are necessary to facilitate traffic, offer wholesome and edifying means of exercise for the general populace and alleviate the causes which result in the needs of maintaining penal and charitable institutions.

Large cities require parks as a necessary component in sustaining their wholesome vitality. They are not necessary for such purposes to a village when suitable, quiet and pleasant outdoor retreats are ever present and to be found in abundant degree within a few minutes journey from the center of the village. But their advantages are self apparent and desirable. Their possession by the public for its own free right of use facilitates the perpetual preservation of characteristic, beautiful and valuable natural features of the locality. If a city can afford it there are many and excellent reasons why its wants should be supplied.

On the assumption that a city can afford and wants parks or that it has been demonstrated to be a wise financial policy to foster its scenic treasures what are the possibilities?

Every locality has interesting and peculiarly individualistic natural distinctions; some have a lake or river shore, others a specially choice flora or geological formation and practically all have a topography suited to be accented and developed with marked aesthetic advantage. Given any one or several in combination of these advantages the framework of an excellent park possession exists. Unite such circumstances with the improvement of connection links of passageways be they country lanes—and how beautiful they are! of village streets with its ordinarily commodious home grounds surrounding each residence, a building limit whereby the tree lined streets appears pleasantly spacious and there again one of the main essentials in a system of park holding exists.

Every city has its public building such as town hall and schools; contemplate what a dignified grouping these would compose if they flanked a liberal open space to be used as a park or common!

A city's needs is a progressively increasing one. As it grows its park needs increase. A city may be extravagant in the disbursement of its funds for park purposes by acquiring land too far ahead of its needs thus losing more in interest charges than would offset the added cost of the same area at a later period. It may likewise delay so long as to require a heavy penalty being paid for the delay with the added disadvantage that the property acquired will be smaller than needed or that essential parts of it are virtually impossible of acquirement. But the probability of such occurrence in village life are so remote as to be virtually non-extant.

It remains, however, that every city or village can afford something more in public open areas than roads and streets.

Whether it possesses them remains for the community to determine. Every public work is an unmistakable reflection of the communities life, aims and character. Let it be emphasized that it is unmistakable. Observe its streets, public and private architecture and general upkeep of its homes and public properties. If there is poverty or slovenliness in its people it will be evident in the streets and homes; sham at home will show itself in public construction work; intelligence, orderliness and human sympathy will indicate itself by refinement, substantiality, dignity and public pride in the community. Mark you, the works of a community are a very good indication of the individuals composing the community, not what these individuals would have the general public believe them to be.

The innate human fibre composing the fabric of normal American citizenship and American community life responds feelingly to a display of beauty. And if so be it, why, it may be asked is not the wealth of loveliness abounding throughout the State more generally known and fostered.

Wisconsin is an Elysium of loveliness containing myriads of lakes with water wonderfully pure and wholesome, streaked with rivulets coursing through banks of greenery. Exceedingly interesting in general surface conformation and marsh, dale and upland scenery and as a whole composing a landscape of wondrous beauty it is deplorably unfamiliar to most Americans. To those privileged to enjoy and reside amid this beauty the query is: what is being done to protect it from defilement and preserve it for future generations? Following in the wake of human settlement there is a destruction of scenery certain, inevitable, and necessary according to our present day modes of life and manners of civilization. In conserving and fostering beauty it is to be borne in mind that every locality has a peculiar distinctiveness in something native. To select the essence, the type species of such possessions, and adapt it to withstand the strife continuously operating toward change and cause it to serve the needs and desires of the community economically, thoroughly and satisfactorily is the primary motive in the establishment of outdoor areas notable for their excellence and valuable scenery.

Selection of areas:

In the selection of areas there should be as little duplication of the same types as possible. Each area should have individuality when developed. Size alone does not necessarily indicate merit, indeed it is often possible to develop a more valu-



American Ivy. *Ampelopsis quinquefolia*, used as a porch screen.



Van Houten's Spirea.

able park on one hundred acres than on one twice that size, likewise waste land is frequently better adapted to park development than more expensive property.

Parks and related areas should be selected with a view of their development; a charming woodland when made accessible by suitable approaches and usable by necessary conveniences may be decidedly commonplace whereas a slight extension of another location at the time decidedly tame and uninteresting in comparison may be stupendously more valuable as park property when developed.

In the selection of sites, the determination of their boundaries and in the preparation of a general scheme of development the best procurable advice should be enlisted if the net returns shall be at all commensurate with the possibilities.

The proposed development should fit the ground.

It is well to bear in mind that parks are scenic grounds and to make that scenery conveniently and agreeably accessible, construction work is necessary. But in a naturalistic domain drives and walks are at best necessary evils and their localities are, therefore, of extreme importance if with age the parks are to increase in value.

During the past quarter of a century wonderful progress has been made in park development and yet there is a deal to be desired in park construction. Any public undertaking involves the exercise of business methods and when applied to parks—primarily works of art—it requires unusual talent to realize when for art's sake a given expenditure is worth while or imperative and when and where an aesthetic sacrifice may best be made to reconcile the project with the business phase of the problem.

When it is recalled that the determining officials of park projects are usually active, successful business men it is easily conceivable that the work may easily assume complexity. They have, usually good practical business judgment, a good imagination, broad sympathies, forceful will and admirable intuition. Altogether they are excellent judges of market values in commercial commodities or problems. Yet it not infrequently happens that in park work their judgment is faulty since they are prone to judging too much on immediate results or on the effect produced for and on the present populace. An error of that sort may lead toward serious complications calling in its last stages for radical and difficult readjustments.

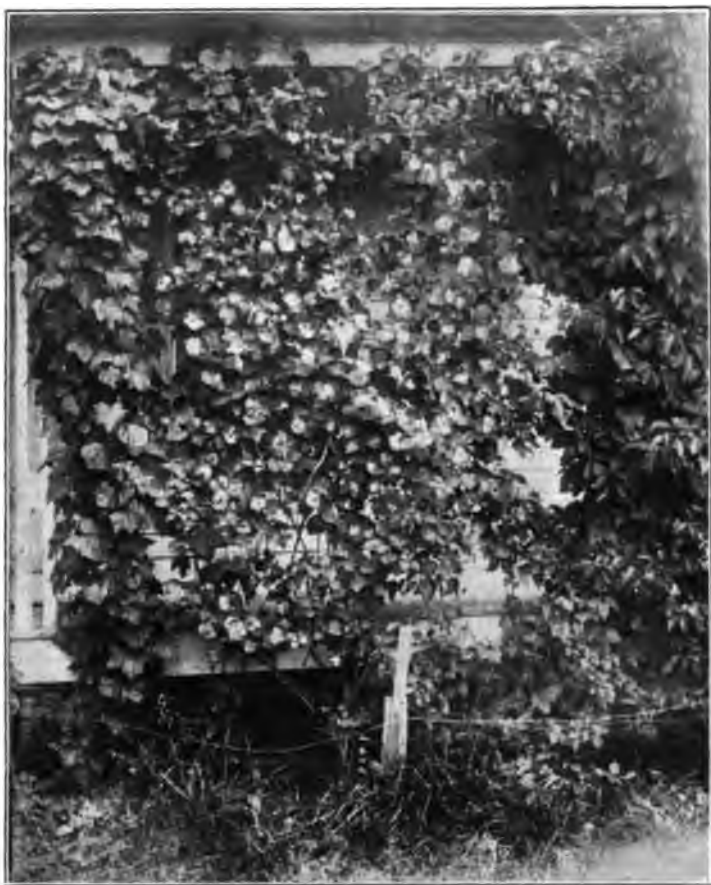
In park work the motives of many parts of a design are not apparent for a considerable period after the work is apparently

finished. Some provisions as seen alone present no specially dominant appeal but are included for their general relation with other parts. Although possessing great ultimate value as a whole a business man is often led to ignore or with slight consideration brush aside by his decisions such features of extreme potential value because to such a mind it is vaguely or not at all apparent at the time.

How to acquire.

The method of acquirement of property may be by an appointive body with power of trustee thereby enabling it to accept gifts and administer affairs in the public's behalf. In the personnel of such a body will largely rest the success of the project. The capacity of its members to reconcile conflicting interests, to act with a forethought and judgment that time stamps with approval, to progress, create and add momentum in its course requires persistent application during a long series of years if any material advances are to be made. There will inevitably be losses, failures, wastes and other irritating drawbacks but in the end the result will be accomplished if only a single individual assumes the initiative and is supported in his acts by a community who really want what such an agent endeavors to secure.

But this has reference specifically to a thorough-going, advancing park development. The policy of park improvements may start very modestly. Every locality has suitable areas of large potential park value. In the ordinary course a town provides and maintains streets and ways because its business interests demand them or the owners of land desire them located to best suit their individual holdings or by virtue of a simple rectilinear system of subdivision the titles of respective lots are more easily described and recorded. That it is frequently possible to increase the value of individual owners' property while adjusting communication ways with nearby scenic areas is not so generally appreciated as it may be. Where it is the town needs to incur no additional expense for park drives over what it otherwise would if parks did not exist. Such a circumstance may be specifically pointed out in this convention city. Traverse Second Ave. to the river and a roadway is encountered which with proper attentions of a comparatively minor sort in the vegetation and grading would secure an excellent park drive. Or endeavor to gain access to some of the riparian views of the Baraboo River and it is learned that a specially handsome aspect is inaccessible by reason of private property intercepting the route or a detour



From left to right, Moonseed, Climbing Honeysuckle, Bittersweet,
all native vines. From photo by W. A. Toole, Baraboo.

through circuitous and ordinary village streets becomes necessary and thereby detracts from, or totally loses the park advantages.

Or endeavor to mount the eminence just north of the business center of the village from whence a highly valuable and excellent outlook over the town toward Devils Lake and upon the lovely panorama is to be gained and note the awkward and steep ascent of the approach road. That hill top made conveniently and pleasurably accessible is of such aesthetic value to Baraboo that only wonderment can be expressed as to how the town could so long afford to neglect its opportunities. Again, a nearby geological formation of particularly interesting beauty is the mecca of many pilgrimages by students and lovers of the beautiful everywhere. To design a pleasure drive connection between Devils Lake and Baraboo is essential to the full appreciation and proper utilization of the scenic possibilities of this locality.

Caution is desirable in initiating park projects. There is danger of attempting too much at the start or in being ill advised. If the scenic assets of a community are to be utilized, their possession really appreciated and made useful it will be an incentive to greater subsequent exertions for extensions.

It is desirable to gain general support in a project of this sort and to this end a general subscription list is of value. Touch a man's pocketbook and you have his attention. Continue to do so annually and you have his interest and with that it requires but a proper administration in the economical conduction of the work and the result secured therefore to turn such an one to an influential and needed supporter. See to it that subscribers are well informed as to the progress and details of the work, stimulate each one to share in the expense according to a proportionate capacity, enable each one to satisfy himself that there is a close and satisfactory accountability of receipts and disbursements and the work conducted judiciously and economically and the means of support will be forthcoming in any live intelligent community.

As an incentive to a general civic pride, a wholesome public sentiment, progressiveness and a stimulant to procuring pleasure in life this mode has been amply demonstrated as being practicable and successful.

It is well to bear in mind that the way to get started is to start. To debate too long on pros and cons consumes energies without result. Do something and in the course of your activities allies will appear to assist by their counsel, means and other necessities.

If no other more important operation can be undertaken, let everyone start and plant shrubs and trees on their home grounds or make a sample of a block. Display the effort for improvement and it will be the cause for promptings and directions toward what is proper.

There is opportunity for each individual to exert himself be it ever so humble. If the desire for improvement is really sincere and general the public activities may be conducted by a special body.

DISCUSSION.

The Secretary—I wanted to add two or three thoughts on Mr. Mische's paper. One was the question as to when is the proper time to select park areas. Baraboo has little or no park area, no public grounds that I know of. It is time for you to start at park work? You *have* no public grounds, do you *want* public grounds, do you expect to be of such a size that you will need them. Of course in a village or small city pleasure grounds and the country are right near at hand. This is a question you should ask yourselves at this time; Are you ready, and if you are, all the other things will come. And in that connection I wish I might have permission to say a few words about Madison's system of parks. I cannot do justice to so large a subject, and yet I think the conditions in Baraboo and many other cities are similar to those in Madison fifteen years ago. Fifteen years ago there were no public grounds in Madison with the exception of the capitol grounds, and a deserted cemetery called Orton Park. At the present time we have thirty miles of drives and about 200 acres of park grounds and playgrounds which requires the sum of about \$14,000 a year to support, and it has required the expenditure of about \$170,000. Now, I might outline that briefly to show you how it began. It began by the extension of the University drive across marshy land to some country roads beyond. That was certainly a modest beginning. I think I could say here now, and I may perhaps repeat it, that the park system and the drive system are due very largely, if not wholly to the energy and the unceasing work of one man. We have just one man there who started that thing and carried it through in spite of every form of opposition. If you are going to accomplish anything in Baraboo you have got to find one man to make the start, who is willing to give his time and money and energy to carry that through. We have that man in Mr. John M. Olin, and Madison owes him a debt it never can repay. He saw the possibilities of an extension of this drive, he solic-

ited subscriptions of \$5, got a few subscriptions and the work was extended slightly, by degrees. Nothing was done by the city of Madison, everything was done by public subscription. Fortunately the beginning was at the time of the bicycle craze. Everybody who had a bicycle and who was interested in good bicycle roads gave \$5, and people who had carriages gave \$5 more. Mr. Olin gets everything he wants and now we are getting our contributions in \$10,000 chunks. The most important work is the development of park areas, not from valuable land, but from waste land. We are creating our parks along the sloughs around the lakes; they have been an eye sore and a nuisance so the shore rights are secured at a comparatively small sum, and a dredging company is hired to dredge and fill in that area and several parks have already been created and other parks will follow.

This will probably not be of special interest to you, except it in one sense applies to your city. There was a time when we had nothing; now we have a great deal. If there had been no one to start, if one man had not said, "This thing can be done and it shall be done," we would have been parkless today, and we have the finest park system and the finest drive system of any city in the northwest of its size, and it would gladden Mr. Tiplady's heart to be in one of our Madison parks and find that all of the planting in that park is of native plants; there is not an exotic in that park, and nearly all the planting on our driveways is of native plants. And there is a river connecting the two lakes on which Madison is situated that had been practically a dumping ground for fifty years until it was an eye sore,—whenever the citizens of Madison passed out of the city on the railroad they shut their eyes—eighty thousand dollars has been expended in dredging and parking it until it is now a beautiful part of our park system. All these things can be accomplished in proportion in Baraboo or any other city of the state; if the people of the city will it, there is no question about money. There is plenty of money in Baraboo, as there is in every other city if you go at it right and get it.

Mr. McPetridge—Mr. Mische in his paper calls the attention of the citizens of Baraboo to the fact that we have not made much of our natural possibilities; I think we ought to take that into consideration. Of course it is quite a criticism, but I think we ought to receive it with good grace. I think he is quite right in saying what he has. It is not altogether due, this not making enough of our natural possibilities, it is not due to us today perhaps so much as to those who origin-

ally laid out the town. Of course that was done many years ago, it cannot now be helped. It has often been a great source of wonderment to me why, in laying out towns the surveyors, or men in charge should pay so little attention to the natural features. We have, for instance, our river here which is called the Baraboo river, and which is the one main and largest feature of the city, and with reference to it there have been no plans laid out, as the paper very well calls attention to. I think at this time I should like to bring before the people in connection with this paper the possibilities in this direction.

Now, we have had some little talk, the papers have had more or less to say about a Baraboo City Park. It seems to me in our conception of a city park we ought not to begin in a very small way. I had some time ago a long talk and a long walk with Mr. Olin, down on one side of the river and back on the other side, and he showed me very conclusively why we ought to, if we ever do anything about the matter, take in the entire river system and not content ourselves by laying out a little square plat of ground somewhere and doing a little meager park work somewhere and not large enough in its conception. Now, by laying out the entire river system in a broad way, we need not spend any large sum of money to begin with, but by obtaining all of it we can gradually, as years go on, bring the thing into a high state of cultivation and it seems to me it would be of a very great value, not only to the city, but to all the people.

Mr. Toole—Those who live outside of the corporation should be interested in all that goes on in Baraboo, and certainly there is no place that I know of where it would seem as though the spirit of reciprocity were stronger between those of the country and city than has been here manifested in the extension of the city streets; the city and the country have united in the work of the improvement. We see the influence of the city reflected, as mentioned today, in the lawn mowers and the appearance of the farm lawns and it seems as though it were not out of place for these outside to feel an interest in the city and express an opinion about it, and for years many of us have looked on and wondered when Baraboo would have a park, because I think it would reach way back to the memory of the oldest inhabitant when a park was first talked of, yet the opportunities have been closed the section which was looked on for a park was finally divided up into city lots, and that dividing up into city lots and acre property is going on so

rapidly that we are coming I think very near to the close of opportunities in Baraboo for anything in the way of a park that will be universally accessible, so that in the course of not many years you will have to have a park so far out that you will have to drive to it. I hope that some action will be taken and that the people of Baraboo will be awakened up to the present opportunities and the possibility of losing those opportunities. I do not see why a very few might not get together, call themselves a park association, say what they will subscribe simply for a nucleus to draw others in and increase the size of the association, more clearly define its intention and more nearly look up its opportunities. There you will have a beginning, and I think in that little gathering of people somebody, perhaps not a John Olin will develop, but several perhaps will be brought forward who will push the work and it will not be very long before you will see means in sight for securing your grounds. We have beautiful drives in all directions, so that if the roads are in condition at all to drive on the outing is pleasant, and yet after all, if we get the 10,000 city which we hope for, there will always be the time when there will be need of something near by that you will not be obliged to take long drives to enjoy the beauties of nature.

Following this discussion Mr. Wm. McFetridge of Baraboo spoke at length of the proposed State Park at Devils Lake.

The Secretary then offered the following resolutions which were unanimously adopted.

RESOLUTIONS.

WHEREAS, There is a movement now on foot to induce the State of Wisconsin to establish and maintain a State Park at Devil's Lake, and

WHEREAS, The project to preserve for all time this beautiful region, now threatened by destruction, appears a commendable one which should receive the support of every citizen of our state, and

WHEREAS, From a Horticultural standpoint, the preservation of the region is particularly desirable, since it includes and primarily is for the protection of the flora and for its increase and development,

Be it Resolved, that the State Horticultural Society this day assembled, unanimously declares itself in favor of the said project and endorses it, and

Be it Further Resolved, that this society recommends that the next session of the legislature appropriate a sum sufficient to purchase and set aside this region to be used and maintained as a State Park, subject to the state laws, and open to the use and enjoyment of the people of the state, for this generation and for the generations to come.

Baraboo, Wisconsin, August 29, 1906.

TRANSACTIONS SUMMER MEETING.

Baraboo, Wis., Aug 29, 1906.

The following amendment to Art. V of the Constitution was adopted:

The members from the several congressional districts shall be chosen by the delegates of their respective county and local societies, present at the annual meeting of this society; or in case of the absence of delegates from such societies or in case of failure to elect, such members shall be chosen from among the members of this society present from such districts. But if any district is not represented, the vacancy shall be filled by vote of the members of this society present at the annual meeting.

On motion of the Secretary, the following were made honorary annual members of the Society: Hon. E. G. Marriott, Mayor of Baraboo. Mrs. J. E. English of Baraboo, Mr. A. B. Stout of Baraboo and Mr. Wm. McFetridge of Baraboo.

On motion of Mr. Toole, a vote of thanks was extended to the Choral Union of Baraboo for music furnished at the evening session.

Adjourned.

PROGRAM.

Baraboo, Aug. 29, 1906, 9: a. m.

Invocation.

Words of Welcome, Hon. E. G. Marriott, Mayor of Baraboo.

Native Ferns, William Toole, Baraboo.

Some Native Flowers Worthy of Cultivation, Dr. E. Everett, Madison.

2:00 p. m.

All the Native Shrubs Worth Planting, John Tiplady, Lake Geneva.

Native Vines for Shade and Ornament, W. A. Toole, Baraboo.

Native Aquatics, Wm. Longland, Lake Geneva.

Native Edible Fungi, Mrs. J. E. English, Baraboo

Lawns and Surroundings, Franklin Johnson, Baraboo.

Practical Botany, Prof. A. B. Stout, Baraboo.

Evening.

Address, Prof Sandsten, University of Wis.

Civic Improvement, E. T. Mische, Park Supt., Madison.

PREMIUM LIST.

Garden Flowers.

	1st.	2d.
Best display Comet Asters	\$1 00	\$0 50
Best display Branching Asters	1 00	50
Best display Dwarf Asters	1 00	50
Best display Asters in extent and variety....	2 00	1 00
Best display Single Dahlias	1 00	50
Best display Double or Show Dahlias.....	1 00	50
Best display Cactus Dahlias	1 00	50
Best display Perennial Gaillardias	1 00	50
Best display Gladioli	1 00	50
Best display Perennial Phlox	1 00	50
Best display Pansies	1 00	50
Best display Stocks	1 00	50
Best display Sweet Peas	1 00	50
Best display Single Petunias	1 00	50
Best display Double Petunias	1 00	50
Best display Verbenas	1 00	50

Best display Cosmos	1 00	50
Best display Garden Flowers not enumerated in above list	1 00	50
Best, most artistically arranged bouquet of Gar- den Flowers	1 00	50

Potted Plants.

For Amateurs Only.

Best Fuchsia	1 00	50
Best Rex Begonia	1 00	50
Best Tuberous Begonia	1 00	50
Best Begonia other than above	1 00	50
Best Gloxinia	1 00	50
Best Sword Fern	1 00	50
Best Fern other than above	1 00	50
Best Asparagus Plumosus	1 00	50
Best Asparagus Sprengeri	1 00	50
Best display Geraniums	1 00	50
Best display Coleus	1 00	50
Best collection Potted Plants	1 00	50

Wild Flowers.

Best display Golden Rod	1 00	50
Best display Asters (native)	1 00	50
Best display Native Ferns	2 00	1 00
Best, most artistically arranged bouquet of Wild Flowers	1 00	50
Best display Ornamental Wild Fruits	1 00	50
Best display Native Fungi	2 00	1 00
Best collection of Wild Flowers in arrangement and variety; the different varieties to be shown separately	3 00	2 00
Sweepstakes to be awarded to the exhibitor re- ceiving the largest number of first premiums	3 00	

Fruits.

Apples.

Best plate Astrachan	1 00	50
Best plate Early Harvest	1 00	50
Best plate Early Joe	1 00	50
Best plate Oldenburg	1 00	50
Best plate Tetofski	1 00	50
Best plate Transparent	1 00	50

Plums.

Any variety named in Society Fruit List, 1906 50 25

Specimens of plums must be fully colored and ripe enough for culinary use.

Four apples to be shown for a plate.

In plums not less than ten specimens shall be considered a plate.

REPORT OF COMMITTEE ON AWARDS.

Your committees appointed to award premiums would respectfully report the following awards:

Fruit.

Apples—Red Astrachan, Wm. Toole, First Premium.

Duchess, A. D. Brown, First Premium.

Yellow Transparent, A. D. Brown, First Premium.

Plums—Forest Garden, Wm. Toole, First Premium.

Quaker, Wm. Toole, First Premium.

Abundance, Wm. Toole, First Premium.

Lombard, Wm. Toole, First Premium.

We also find that Mr. A. D. Brown has made a fine exhibit of several other varieties of apples, and among them the Saxonian and Lowland Raspberry, and we would recommend a premium of \$1.00 for each plate.

We also find a very fine plate of Peaches exhibited by A. D. Brown for which we would recommend a premium of \$1.00.

We also find a very fine collection of Plums by Wm. Toole, several varieties not enumerated, in the Recommended Fruit List, including 4 plates of seedlings of very good quality.

L. H. PALMER,

L. G. KELLOGG,

Committee on Fruit.

Premiums on Flowers Awarded at Summer Meeting, 1906.

Comet Asters, William Toole, 1st.

Branching Asters, Mary Sansum, 1st; William Toole, 2nd.

Dwarf Asters, Mary Sansum, 1st

Asters, extent and varieties, Mary Sansum, 1st; William Toole, 2nd.

Double Dahlias, Mrs. L. Helm, 1st; Mrs. Frank Berkley, 2nd.

- Gladioli, William Toole, 1st; Mrs. Helm, 2nd.
- Perennial Phlox, Mrs. Helm, 1st.
- Pansies, William Toole, 1st; Mrs. Berkley, 2nd.
- Stocks, William Toole, 1st; Mary Sansum, 2nd.
- Sweet Peas, Mrs. Wilbur Cowles, 1st.
- Verbenas, Mary Sansum, 1st; Mrs. Arnott, 2nd.
- Cosmos, William Toole, 1st.
- Garden flowers unnamed, Mary Sansum, 1st; Mrs. Arnott, 2nd.
- Boquet Garden Flowers, Mrs. Arnott, 1st; Mrs. Helm, 2nd.

Potted Plants.

- Fuschia, Mrs. Arnott, 1st.
- Tuberous Begonia, Mrs. Arnott, 1st.
- Begonia any other variety, Mrs. Arnott, 1st.
- Asparagus Plumosus, Mrs. Berkley, 1st; Mrs. Cowles, 2nd.
- Asparagus Sperengeri, Mrs. Berkley, 1st.
- Display Geraniums, Mrs. Arnott, 1st.
- Pot plants, collection, Mrs. Arnott, 1st.

Wild Flowers.

- Golden Rod, Mrs. Cowles, 1st.
- Collection wild flowers, Ruby Berkley, 1st; Mrs. Helm, 2nd.
- Sweepstakes, Mrs. Arnott, 1st.

Extra.

- Native Fungi, special mention, Mrs. English.
- Ornamental Wild Fruits, Mrs. Cowles, 1st.
- Display Garden Flowers, Mrs. Helm, 1st; Mary Sansum, 2nd.

W. J. MOYLE,
 AXEL JOHNSON,
Committee on Flowers.

Transactions of the Winter Meeting

TUESDAY—EVENING SESSION.

Madison, Wis., Feby. 5, 1907.

The meeting was called to order in Guild Hall at 7:30 p. m.
President T. E. Loope in the chair.

REPORT OF SECRETARY CRANEFIELD.

The year 1906 will be noted in history as one of unexampled prosperity in the commercial and industrial world. In the annals of our Society we may also write 1906 as a banner year. Our work has progressed along the lines laid out at the beginning of the year without serious interruption. Our membership has increased to a very gratifying extent and better than all else our influence for good is being felt and recognized throughout the state and the United States.

Our constitution declares that the object of our Society shall be "the advancement of the art and science of horticulture throughout the state." Liberally construed this may mean dissemination of information in all the branches of horticulture to all the people of the state; the testing of new fruits, flowers and vegetables; a search for better varieties of these; assimilating and bringing directly to the attention of the people the work of our own and other experiment stations; a study of the best methods of marketing the products of the orchard and garden.

In many of these we have fulfilled our obligations. We give of the best we have to all who will read in our reports and bul-

letins; we have planted and maintained trial orchards in northern Wisconsin and in many other ways "advanced the art and science of horticulture throughout the state."

In brief we are doing things! Not to talk, not to promise, but to *do* things is the supreme test of usefulness in an individual or association. This is expressed in a common phrase "make good."

As members of the State Horticultural Society of Wisconsin we may be pardoned for a comfortable feeling of pride and satisfaction when reviewing the work of the past year and say we have "made good." Descending now from these flights of congratulation to actual details I present herewith an outline of the work for the past year.

MEMBERSHIP.

The membership has increased from 350, the date of my last report, to 525, or an increase of 50 per cent. A very large proportion of the new members are business or professional men, a very gratifying sign as it shows our work to be broad enough to attract amateurs as well as professionals. The very remarkable book offers to new members authorized by the executive committee has helped materially to increase the membership. The interest manifested by many of the older members has also helped materially to increase the list.

Thirty-two memberships lapsed during the year. The membership roll is revised every two months when all in arrears are dropped. Before doing this, however, three notices are sent at intervals of two weeks.

The life membership list has grown to the extent of twenty-two names, making a total of eighty-two life members. It has been the policy of your secretary to get life memberships whenever possible in preference to annual believing that such a course tends to strengthen the Society.

SUMMER MEETING.

The summer meeting at Baraboo compared favorably with the summer sessions of past years.

STATE FAIR EXHIBIT.

The exhibit of the society at the State Fair attracted more than the usual amount of attention and the success of that exhibit would seem to warrant making it an annual event.

PUBLICATIONS.

The material for the annual report was in the hands of the state printer early in March but in spite of coaxing and threats it was not delivered until late in May. The distribution of the 3,500 copies allotted by the state law has been accomplished through the means outlined last year, viz.: to members and local societies, county clerks, agricultural students and individual requests. Copies have been forwarded on request to every state, to England, China and Australia. Nothing marks more clearly the progress of our society along advanced lines than the demand for our reports.

Three bulletins have been issued during the year, viz.: No. 8, Pruning Orchard Trees, 15 pages, 18 illustrations.

• No. 9, Horticultural Miscellanies No. 1, 10 pages, one illustration.

No. 10, Horticultural Miscellanies No. 2, 11 pages, 3 illustrations.

Of each of these a considerable number of copies remain. Of all preceding numbers the editions are entirely exhausted.

PROCEEDINGS OF EXECUTIVE COMMITTEE.

Four meetings of the executive committee have been held since the date of my last report. Three of these during the week of our last annual convention week and one at Baraboo during the summer meeting. Omitting minor motions and routine affairs the following represents briefly the proceedings of the committee:

Winter meeting: Amendment to Art. III of the constitution proposed permitting members of local societies to become members of the state society on payment of a fee of 50 cents. (This amendment was adopted by the society at the 1907 winter meeting.)

Amendment to Art. V of the constitution proposed. (This was later referred by the society to the executive committee.)

Secretary authorized to enter into contract with L. S. Cheney of Barron for lease of orchard site.

Resolved that the trial orchard committee be a perpetual body, the term of service to be three years one new member being appointed each year.

The location of summer meeting left to board of managers.

Action on amendment to art. V deferred to summer meeting.

At the summer meeting the board resolved to recommend to the society the adoption of the amendment to art. V as follows:

"The members from the several congressional districts shall be chosen by the delegates of their respective county and local societies present at the annual meeting of this society or in case of the absence of delegates from such societies or in case of failure to elect such members shall be chosen from among the members of this society present from such districts. But if any district is not represented, the vacancy shall be filled by vote of the members of this society present at the annual meeting."

Treasurer requested to furnish bond from a bonding company, the expense of same to be paid by the society.

The week following the annual meeting last year a letter was received at the secretary's office from a resident of Taylor county stating that the Northwestern Nursery and Orchard Co. of St. Joseph, Michigan, was engaged in selling contracts to plant orchards in that county and used as an inducement to purchasers the statement that their company was endorsed by this society, and more remarkable still that the society had guaranteed their company against loss to the extent of five thousand dollars and many other equally ridiculous but dangerous claims. While the attempt to protect people against their own cupidity and ignorance is a most discouraging task your secretary felt that such an outrageous prostitution of the good name of this society must not pass unnoticed and the following letter was mailed to 470 newspapers in the state, most of which published the notice.

To whom it may concern:—The Wisconsin State Horticultural Society has given no guarantee to any nursery or orchard company of any nature whatsoever.

Any contracts obtained by means of such representations are void and may be revoked.

Any money paid on such contracts is recoverable by law.

The agent of any nursery or orchard company who obtains contracts by such fraudulent representations commits a criminal offense and may be punished by due process of law.

The necessity of these statements arises from the fact that a certain nursery or orchard company, operating from outside the state, selling fruit trees in acre lots on contract, claims to hold a guarantee from this society to reimburse the company for losses, etc.

This society gives no guarantee of any nature whatsoever to any orchard or nursery company or firm, never has done so, nor ever will do so.

One year ago at our annual meeting I was appointed as chairman of a committee to investigate the subject of protection to bona fide nurserymen against irresponsible jobbers, etc. In

the course of my inquiries I addressed a letter to Attorney General Sturdevant and received the following reply:

Frederick Craneheld.

Sec. Wis. Horticultural Society,
Madison, Wis.

Dear sir:

You say that certain nurserymen of this state are desirous of enlisting the aid of this state in having a law enacted which will provide that every nursery firm doing business in the state be compelled to give bonds or security to insure the fulfillment of their contracts and you ask if such a law is feasible.

This is a question presenting many perplexities and one which should have very careful consideration. If such a law were made applicable to companies outside of the state, but doing business within the state, it would probably be construed by the courts as an interference with interstate commerce, which is prohibited by the federal constitution.

It is my opinion that effective legislation of this kind would have to be enacted by Congress rather than by the state legislature.

Yours very truly,

L. M. STURDEVANT.

Attorney General.

From this it will be seen that state legislation cannot be enacted covering the case. In looking for another solution the following came to my notice. It is taken from a South Dakota nursery catalog and by a proper substitution of names it seems to me to be the solution:

COMMON SENSE

ABOUT TREES AND NURSERY STOCK.

It is estimated that not less than \$125,000 are taken out of this state annually for worthless trees and at criminally high prices; and notwithstanding the work of the State Horticultural Society, this amount is increasing yearly, with the increasing ability of the people to buy and pay.

This is surely a great waste and works a great hardship in many individual cases, and there should be a remedy.

I have been acting as a committee of the State Society for more than a year to try to find and report a remedy; but have reported that I can find no remedial legislation that will stop or modify this without acting equally against legitimate interstate commerce, except that there must be many individual cases that can be reached and punished through the courts.

The best practical remedy is for every planter to become a member of the State Horticultural Society. Send \$1 to....., the secretary, and become a member; get in touch with horticulture and horticulturists and you are safe.

Where you now throw away money, labor and time on worthless or doubtful stock and at actually criminal prices, you will be instructed how to properly expend a few dollars and get satisfactory returns in Orchards, Groves, Fruits and Flowers.

Prop. ——— Nursery,
————, S. D.

BOARD OF MANAGERS.

This board held six meetings during the year for the purpose of auditing bills and the transaction of other business. As the business of the society increases, the value of such a board becomes more and more apparent.

So much for the past year; it has been one of encouragement; the coming year and the future is bright with hope. We should begin it with the determination to move forward. Nothing may remain at rest on this madly whirling sphere on which we live. We must go forward or backward; we cannot stand still. So it must be with our society. We must not only keep up the good work we have commenced but we must broaden our field.

While we feel that we have accomplished much when the opportunities for horticultural advancement in our state are considered, we must admit that we have but just begun.

Here are a few things that we ought to do:

1st. The maintenance of our present trial orchard work with a gradual but limited extension.

2nd. The establishment of model fruit gardens in connection with our orchards or in more accessible places; for instance within the city limits of Wausau, Superior, Barron, Medford,

etc. In this way we could create an interest in small fruit culture and by suitable signs direct attention to our orchards.

3rd. A trial ground for seedlings and new varieties of fruit either in connection with one of the orchards or separate.

4th. Public demonstrations in spraying at certain tree-fruit centers. Manufacturers and dealers in spray pumps would cooperate. I do not think of any other work that, in my opinion, would advertise our society as much as this.

5th. Excursions to the trial orchards at fruiting time. Newspaper paragraphers tell of people living within sound of Niagara Falls a life time without having seen it. There are thousands of people living in Marathon county who have never seen the Wausau trial orchard. We should take them all, by force if necessary, to see the results of the ten years' efforts of this society in their behalf. The railroads will help.

6th. Some systematic work in southwest Wisconsin with the aim to develop this wonderful apple region. Your secretary continues to maintain that there are very few if any regions in the United States better adapted to apple culture than portions of Grant, Richland, Crawford, Iowa and LaFayette counties. From two to six trial orchards should be established in these counties on the plan of the Medford orchard. Five acres in each planted largely to Wealthy and under the control of the society regarding culture, etc., would in a few years become object lessons worth millions to the people of Wisconsin. In addition, and no doubt in direct connection with these, old orchards could be leased and renovated.

Much could also be done by our society to improve the market conditions in this region, at present one of the greatest drawbacks.

7th. Continued aid to local associations which are attempting to solve the problem of marketing the products of the orchard and garden to the best advantage.

8th. More attention to aesthetic horticulture, which may include: Aid in the formation of village improvement associations and furnishing of planting plans prepared by a competent landscape gardener.

9th. Similar work in connection with the state department of education and township governments for the decoration of rural school grounds and cemeteries.

10th. Help the individual no matter whether or not he is a member of the society. This is an unlimited field.

We have here enumerated ten things we ought to do; there are hundreds of others. As the horticultural interests of the state develop new lines of work will appear.

For many weary years have we horticulturists listened to the never varying stories of the live-stock and dairymen to the effect that Wisconsin is a live-stock and dairy and tobacco state, that it is not a fruit state like Michigan and Illinois, etc., until we ourselves have almost come to believe it! Wisconsin does *not* produce as many barrels of apples nor possibly as many bushels of strawberries as Illinois and never will as long as the people of this and other states are permitted to believe that conditions in Wisconsin are not adapted to fruit growing. I am well convinced that there is as much land in Wisconsin as in Illinois that is adapted to strawberry and apple culture. If we cannot grow the same varieties we can grow others that are equally as profitable. Wisconsin possesses the opportunities, let us take advantage of them. We should not be led astray nor permit others to be deceived by the specious argument of opposing interests. Wisconsin is *now* a fruit state and is certain to be a leading fruit state. We may easily produce all of the summer and fall apples needed in the northwest; our berry fields may multiply a thousand fold without creating a surplus when the problems of distribution and marketing are solved; that great empire north of the 45th parallel left desolate by the woodman's axe is being rapidly transformed; fields and farms appear where there was but recently forests; here may be grown strawberries that ripen in August and Duchess apples that will keep until Christmas. Wisconsin *is* a fruit state. Its future as a greater fruit state lies largely with the members of this society. With the wealth of experience behind us, with the momentum gained by our fifty years we should now move forward with no uncertain step.

REPORT OF TREASURER.

L. G. Kellogg, treasurer, in account with the Wisconsin State Horticultural Society.

1906	Receipts.	
Feb. 6.	To balance due society.....	\$427.36
Feb. 9.	To cash from state treasurer.....	400.00
Feb. 9.	To cash from F. Cranefield.....	55.00

WINTER MEETING.

75

Apr. 5.	To loan from German National Bank....	1,000.00
June 7.	To loan from German National Bank....	500.00
July 9.	To cash from state treasurer.....	4,400.00
1907.		
Feb. 5.	To cash F. Cranefield, memberships.....	342.00
Feb. 5.	To F. Cranefield, cash miscellaneous....	72.27
		<hr/>
		\$7,196.63

Disbursements.

Feb. 8.	492 By Prof. U. P. Hedrick, exp. winter meet	\$59.25
Feb. 8.	493 Mrs. J. D. Treleven, exp. winter meet	4.00
Feb. 8.	494 Mrs. L. W. Barnes, exp. winter meet	8.50
Feb. 8.	495 Wm. Toole, exp. winter meet.....	2.20
Feb. 8.	496 W. A. Toole, exp. winter meet.....	1.80
Feb. 8.	497 R. J. Coe, exp. winter meet.....	1.30
Feb. 8.	498 M. V. Sperbeck, exp. winter meet...	4.10
Feb. 8.	499 M. S. Kellogg, exp. winter meet....	2.10
Feb. 8.	500 L. A. Carpenter, exp. winter meet...	3.40
Feb. 8.	501 W. J. Moyle, exp. winter meet.....	4.25
Feb. 8.	502 A. H. Reupke, exp. winter meet....	13.70
Feb. 8.	503 A. Johnson, exp. winter meet.....	13.90
Feb. 8.	504 M. Crawford, exp. winter meet.....	24.00
Feb. 8.	505 Irving Smith, exp. winter meet....	6.45
Feb. 8.	506 T. E. Loope, exp. winter meet.....	6.90
Feb. 8.	507 Eva Loope, exp. winter meet.....	5.00
Feb. 8.	508 W. B. Bussey, exp. winter meet....	4.00
	509 void.	
Feb. 8.	510 Franklin Johnson, exp. winter meet.	1.50
Feb. 8.	511 Geo. E. Rowe, exp. winter meet....	20.10
Feb. 8.	512 J. J. Menn, exp. winter meet.....	4.05
Feb. 8.	513 D. E. Bingham, exp. winter meet...	14.70
Feb. 8.	514 M. E. Henry, exp. winter meet.....	4.60
Feb. 8.	515 Donna Dean, services sten.....	23.65
	516 to 522 inclusive void.	
Feb. 9.	523 Parsons Prtg. Co., office supplies....	2.75
Feb. 9.	524 Univ. Co-op. Co., books.....	9.60
Feb. 9.	525 Park & Saffle Co., office supplies....	4.60
Feb. 9.	526 Mautz Bros., office supplies.....	2.25
Feb. 9.	527 McMillan Co., books.....	7.26
Feb. 9.	528 Cantwell Prtg. Co., prtg.....	98.30
Feb. 9.	529 T. E. Loope, salary.....	50.00
Feb. 9.	530 T. E. Loope, fruit for winter meet..	5.00
Feb. 9.	531 Geo. P. Gifford, hotel exp.....	100.00
Feb. 10.	532 Geo. P. Gifford, hotel exp.....	83.00

Feb. 10.	533	H. H. Whetzel, exp. winter meet....	49.50
Feb. 10.	534	F. Craneffeld, cash for exp. acct.....	300.00
Feb. 12.	535	Geo. P. Gifford, hotel exp.....	5.25
Feb. 12.	536	W. H. Hanchett, exp. winter meet..	4.32
Feb. 12.	537	F. C. Bach, exp. winter meet.....	13.00
Feb. 13.	538	T. E. Loope, premiums.....	2.00
Feb. 13.	539	H. Simon, premiums.....	15.00
Feb. 13.	540	A. N. Kelly, premiums.....	30.00
Feb. 13.	541	L. H. Palmer, premiums.....	4.00
Feb. 13.	542	Wm. Toole, premiums.....	7.00
Feb. 13.	543	W. A. Toole, premiums.....	1.50
Feb. 13.	544	A. D. Brown, premiums.....	3.50
Feb. 13.	545	D. E. Bingham, premiums.....	6.00
	546	void.	
Feb. 13.	547	O. J. Burnham, premiums.....	2.00
Feb. 13.	548	Geo. J. Jeffrey, premiums.....	.50
Feb. 12.	549	C. A. Hatch, premiums.....	5.50
Feb. 20.	550	Miss E. Jacobson, reporting winter meet	79.00
Mar. 1.	551	F. Craneffeld, salary, Feb.....	100.00
Mar. 6.	552	Est. Timothy Brown, office rent....	30.00
Mar. 6.	553	E. W. Keyes, postage.....	20.00
Mar. 27.	554	T. E. Loope, expenses.....	3.50
Mar. 27.	555	Donna Dean, sten.....	24.75
Mar. 27.	556	Parsons Prtg Co., office supplies....	4.85
Mar. 27.	557	Albertson & Hobbs, nursery stock...	5.16
Mar. 27.	558	Jennie Pitman, outline maps.....	2.00
Mar. 27.	559	James E. Moseley, books.....	2.50
Mar. 27.	560	Webb Pub. Co., premium books....	3.34
Mar. 27.	561	Orange Judd Co., premium books...	5.96
Mar. 27.	562	The Macmillan Co., premium books..	13.29
Mar. 27.	563	Park & Saffle, office supplies.....	4.95
Apr. 2.	564	F. Craneffeld, salary, March.....	100.00
Apr. 2.	565	Est. Timothy Brown, office rent....	15.00
Apr. 14.	566	C. L. Pearson, exp. winter meet....	1.50
Apr. 30.	567	F. Craneffeld, salary, Meh.....	100.00
Apr. 30.	568	Est. Timothy Brown, office rent....	15.00
May 31.	569	T. E. Loope, exp. acct.....	9.90
May 31.	570	L. G. Kellogg, exp. acct.....	14.89
May 31.	571	Donna Dean, sten.....	14.25
May 31.	572	H. Gohdes, services Wausau orch....	20.00
May 31.	573	Walter Pfaff, services Wausau orch..	9.00
May 31.	574	Menges Pharmacy, supplies.....	3.45
May 31.	575	A. D. & J. V. Frederickson, offi. furn.	7.51
May 31.	576	Pardee Drug Co., copper sulfate....	8.75

May 31.	577	Yahr & Lange Co., arsenate of lead..	15.00
May 31.	578	W. H. Adams, services Eagle River..	11.00
May 31.	579	Jewell Nursery Co., nursery stock..	29.20
May 31.	580	Phoenix Nursery Co., nursery stock..	33.29
May 31.	581	Hatch & Bingham, nursery stock....	64.12
May 31.	582	S. F. Harris, express charges.....	3.15
May 31.	583	Morrell and Morley, nozzles.....	2.10
May 31.	584	A. D. Brown, nursery stock.....	3.50
May 31.	585	W. D. Williamson, tree protectors...	8.10
May 31.	586	Park & Saffle, office supplies.....	4.15
May 31.	587	Ed. Gensmann, rent and services, Wausau	88.50
May 31.	588	The Macmillan Co., premium books.	4.76
May 31.	589	Franklin Johnson, services.....	5.00
May 31.	590	Cantwell Prtg. Co., printing.....	81.00
June 1.	591	L. S. Cheney, services Barron orch...	7.15
June 1.	592	P. A. Peterson, services Poplar orch..	101.49
June 1.	593	F. Craneheld, salary, May.....	100.00
June 1.	594	Est. Timothy Brown, office rent.....	15.00
June 5.	595	E. W. Keyes, postage.....	10.00
June 18.	596	E. W. Keyes, postage.....	101.80
July 3.	597	F. Craneheld, salary, June.....	100.00
July 3.	598	F. Craneheld, exp. acct.....	25.00
July 5.	599	Est. Timothy Brown, office rent....	15.00
July 9.	...	Loan German Nat. Bank.....	1,000.00
July 9.	...	Loan German Nat. Bank.....	500.00
July 9.	...	Interest German Nat. Bank.....	18.75
July 23.	600	F. Craneheld, exp. acct.....	75.00
Aug. 2.	601	T. E. Loope, exp. acct.....	13.40
Aug. 2.	602	Pardee Drug Co., copper sulfate....	4.38
Aug. 2.	603	Buffalo Wire Works Co., wire.....	7.58
Aug. 2.	604	W. D. Williamson Tree Protectors..	1.75
Aug. 2.	605	Wm. Owens, supplies.....	3.25
Aug. 2.	606	P. A. Peterson, services Poplar orch.	29.70
Aug. 2.	607	R. J. Coe, exp. acct. trial orch. com.	58.89
Aug. 2.	608	W. J. Moyle, exp. acct. trial orch. com.	43.81
Aug. 2.	609	D. E. Bingham, exp. acct. trial orch. com.	49.78
Aug. 2.	610	Cantwell Prtg. Co., prtg.....	19.75
Aug. 2.	611	Park & Saffle Co., supplies.....	2.75
Aug. 2.	612	H. P. Jacobson, sign board for Barron orchard	7.00
Aug. 2.	613	L. S. Cheney, services Poplar orch..	10.00
Aug. 2.	614	Donna Dean, services sten.....	17.25

Aug. 2.	615	F. Craneheld, salary July.....	100.00
Aug. 2.	616	D. E. Bingham, nursery stock.....	14.40
Aug. 22.	617	Est. Timothy Brown, office rent....	15.00
Aug. 25.	618	E. W. Keyes, postage.....	5.54
Aug. 29.	619	Am. Express Co., express.....	5.55
Aug. 29.	620	Irving Smith, exp. summer meet....	12.02
Aug. 29.	621	C. L. Richardson, exp. summer meet..	9.80
Aug. 29.	622	Wm. Longland, exp. summer meet..	12.25
Aug. 29.	623	John Tiplady, exp. summer meet....	12.25
Aug. 29.	624	Axel Johnson, exp. summer meet....	12.25
Aug. 29.	625	R. J. Coe, exp. summer meet.....	5.99
Aug. 29.	626	H. C. Melcher, exp. summer meet..	5.22
Aug. 29.	627	Dr. E. Everett, exp. summer meet..	2.57
Aug. 29.	628	Wm. Toole, exp. summer meet.....	10.00
	629	void.	
Aug. 30.	630	F. H. Bertram, exp. summer meet....	31.55
Aug. 30.	631	W. C. Andrews, services.....	5.25
Aug. 31.	632	J. C. Vaughn, greenhouse plants....	21.87
Sept. 1.	633	F. Craneheld, salary Aug.....	100.00
Sept. 1.	634	W. P. Bussey, exp. acct. summer meet.	9.82
Sept. 1.	635	Wm. Toole, premiums summer meet	9.50
Sept. 1.	636	Mary Sansum, premiums summer meet	7.00
Sept. 1.	637	Mrs. Frank Berkley, premiums sum- mer meet	3.00
Sept. 1.	638	Ruby Berkley, premiums summer meet.	3.00
Sept. 1.	639	Mrs. C. Arnott, premiums summer meet.	10.00
Sept. 1.	640	Mrs. J. E. English, premiums sum- mer meet.	2.00
Sept. 1.	641	Mrs. Wilbur Cowles, premiums sum- mer meet.	3.50
Sept. 1.	642	Mrs. L. Helm, premiums summer meet.	6.00
Sept. 1.	643	A. D. Brown, premiums summer meet.	5.00
Sept. 3.	644	E. W. Keyes, postage.....	14.00
Sept. 18.	645	W. A. Toole, per diem and exp. State fair	28.26
Sept. 18.	646	G. A. Clark, rent Poplar.....	1.00
Sept. 18.	647	Emma Jacobson, reporting summer meet	33.05
Sept. 18.	648	F. Craneheld, exp. money.....	100.00

Sept. 18.	649	E. W. Keyes, postage.....	44.00
Sept. 22.	650	Aleen Linley, advertising.....	5.00
Oct. 1.	651	F. Craneffeld, salary Sept.....	100.00
Oct. 1.	652	Est. Timothy Brown, rent Sept. and Oct.	30.00
Oct. 1.	653	T. E. Loope, exp.....	12.15
Oct. 1.	654	Donna Dean, sten.	16.13
Oct. 1.	655	The Fruit Grower, books.....	2.00
Oct. 1.	656	Menges Pharmacy, supplies.....	3.40
Oct. 4.	657	A. D. Brown, rent, Poplar.....	1.00
Oct. 4.	658	P. A. Peterson, services and rent Pop- lar Orchard	77.90
Oct. 4.	659	Ed. Gensmann, labor, Wausau Orch.	35.93
Oct. 4.	660	Henry Gohdes, services, Wausau orch.	5.00
Oct. 4.	661	A. D. & J. V. Frederickson, panels, State Fair	5.60
Oct. 4.	662	Baraboo Republic, Prtg. Co., prtg...	3.00
Oct. 4.	663	Cantwell Prtg. Co., prtg.....	29.51
Oct. 4.	664	Webb Pub. Co., premium books.....	2.67
Oct. 4.	665	Orange Judd Co., premium books...	5.87
Oct. 4.	666	Univ. Co-op. Co., premium books...	6.00
Oct. 4.	667	Doubleday Page Co., premium books	7.20
Oct. 4.	668	The Macmillan Co., premium books.	20.06
Oct. 11.	669	Grace & Hudnall, services.....	5.00
Oct. 11.	670	E. B. Banks, surveyor's fees, Maple orchard	3.00
Oct. 15.	...	Cash for Bond D. Thomas.....	5.00
Oct. 20.	671	Helge Johnson, registering lease....	2.40
Oct. 26.	672	J. M. Dunn, freight charges.....	3.88
Oct. 29.	673	E. W. Keyes, postage.....	20.00
Oct. 29.	674	E. G. Doherty, rent, Maple orchard.	15.00
Nov. 1.	675	F. Craneffeld, salary, Oct.....	100.00
Nov. 1.	676	Est. Timothy Brown, office rent....	15.00
Nov. 22.	677	E. W. Keyes, postage.....	19.00
Dec. 1.	678	Est. Timothy Brown, office rent....	15.00
Dec. 1.	679	Wm. Toole, exp. acct. as delegate...	28.00
Dec. 1.	680	F. Craneffeld, salary for Nov.....	100.00
Dec. 17.	681	Donna Dean, services sten.....	16.88
Dec. 17.	682	L. G. Kellogg, exp. acct.....	25.99
Dec. 17.	683	T. E. Loope, exp. acct.....	14.80
Dec. 17.	684	Cantwell Prtg. Co., prtg.....	43.00
Dec. 18.	685	W. J. Moyle, exp. as delegate.....	24.90
Dec. 18.	686	The Macmillan Co., premium books.	8.04
Dec. 18.	687	The Orange Judd Co., premium books	1.03
Dec. 18.	688	W. D. Williamson, tree protectors..	3.00

Dec. 18.	689	L. S. Cheney, services Barron orchard	5.82
Dec. 18.	690	Capital City Paper Co., paper.....	2.66
Dec. 18.	691	John Wiley & Sons, books.....	1.35
Dec. 18.	692	Hatch & Bingham, nursery stock....	4.41
Dec. 18.	693	E. P. Sandsten, exp. acct.....	2.32
Dec. 18.	694	D. E. Riordan, Eagle River Orch...	86.50
Dec. 31.	695	L. S. Cheney, rent, Barron orch. 1907 1907.	25.00
Jan. 2.	696	F. Cranefield, salary.....	100.00
Jan. 2.	697	Est. Timothy Brown, office rent....	15.00
Feb. 5.	698	F. Cranefield, exp. acct.....	364.24
Total			\$6,460.46
Feb. 5.		Balance on hand.....	736.17
Total			\$7,196.63

REPORT OF THE TRIAL ORCHARD COMMITTEE.

R. J. COE, Chairman.

Mr. President and Members of the State Horticultural Society:

Your committee on Trial Orchards made their annual inspection trip the latter part of July at a time when the season was sufficiently advanced to show what effect the past winter had had on the trees and at the same time show about what the season's growth was or would be.

The first stop was at Barron, which is the new orchard that was located in the fall of 1905 and planted in the spring of 1906. Prof. Cheney, who has charge of that orchard and on whose farm it is located, certainly has given it the very best of care and the trees were in fine shape, there being only one dead out of the one hundred and eight planted. This orchard is on a good site with good soil and ought to show what varieties may be depended on in that part of the state when grown under favorable conditions. We shall watch it with a great deal of interest for we fully expect it to show valuable results.

We next visited the Poplar orchard and while we found some of the conditions somewhat unfavorable and some of the va-

rieties apparently unsuited to the soil and climate, which of course is no more than we expected, still on the whole we consider the outlook far from discouraging. In the first place we do not consider the site an ideal one. While it may not be called really low it cannot by any means be called high ground, and the soil is so very retentive of water that the trees hardly have a fair chance to show what they might do in the same locality under really favorable conditions. While there we made arrangements with Mr. Peterson to relinquish the lease on three acres of this tract and have located a small orchard of three acres at Maple about four miles from Poplar. This is on much higher ground with a lighter, looser soil and is, we think, a much more favorable location.

Of the trees in the Poplar orchard we found Duchess, McMahon, Patten's Greening, Okabena, Malinda, Plumb's Cider, Ben Davis, Haas, Red Astrachan, Pewaukee, Seek-no-further, Utter, Scott's Winter, Yellow Transparent all looking well, in fact much better than we expected to find them. The Wealthy, Fameuse and N. W. Greening are fair to good. Hibernial, Fall Orange and Willow Twig are fair, while Longfield, Golden Russet, Talman and a few others are poor to fair. All the crabs are looking good and making a fine growth. The plums, which are all native, are all looking well and making good, healthy growth.

The first year's planting of cherries is nearly all dead. It so happened that they were planted on the lowest ground and could not stand the excessive amount of moisture there has been there for the past two years. The subsequent plantings are looking fair to good. The greater part of this orchard is under cultivation, but one corner of an acre or two has been allowed to grow up in grass and is not in nearly so good condition at the present time as is the cultivated part.

There was planted at this place in the spring of 1906 two thousand apple grafts of ten of the leading sorts. There was a fair stand, and while they were rather small for the time of year they seemed healthy and vigorous and bid fair to make good trees.

If this whole orchard could be tile drained without too great an expense it would, we think, be a paying investment.

The Medford orchard is in very good condition all around. Nearly all the trees seem healthy and vigorous. About one third of this orchard was in peas, one half in potatoes and the balance apparently had not been cultivated at all. This is probably owing to the fact that this corner is quite low and the wet

season has prevented proper cultivation. Mr. Harris is quite anxious that this corner should be tile drained and has offered to stand one half the expense. We think this would pay well.

We next visited the Wausau orchard where last year it looked as if the whole thing was going to pieces and your committee was so discouraged with the outlook at that time. As you have probably all seen by last year's report the orchard was very badly infected with what was thought to be, and afterwards proved to be, the apple canker. It was decided to adopt very vigorous measures to at least attempt to eradicate this disease, which Secretary Cranefield promptly did with the result that in the whole orchard we only found one spot that showed any signs of the disease. In the treatment of this orchard the results obtained in a single season are so great as to be almost beyond belief. In every case where the canker had been cut out and treated the wound had dried and was growing, or in the case of small spots had entirely grown over with clean, healthy wood and bark and, where a year ago the foliage was small and poor and sickly looking, it is now large and clean and healthy looking. It does not seem possible that such a change in any orchard could possibly be brought about in one short year. The treatment of this orchard and the results obtained in a single season are to my mind of more value to the state of Wisconsin than the whole cost of all the trial orchards since they were first started.

The present outlook of the plum and cherry part of this orchard is far from satisfactory. While we should say the plums have a fair location and good varieties were planted they have degenerated to such an extent that they are little if any better than common wild plums. It is the opinion of your committee that these trees should be heavily manured and severely pruned and very thoroughly cultivated. This we think would work a vast transformation in this part of the orchard.

The cherry trees are planted on the lowest ground of the whole orchard and we do not believe they will ever amount to much where they are. If this orchard is to be continued we would recommend that a few trees be planted on high ground as a further test.

The last orchard to visit was the one at Eagle River. This orchard you will remember is planted on almost clear sand and so far as ever getting an orchard out of it is concerned is a flat failure, but as an object lesson it is very much of a success, for it has fully demonstrated to all those in that vicinity who have



Blight canker on Wealthy tree, Wausau orchard, July 1906.
The crotches were badly affected.



Showing distribution of blight canker on Wealthy tree in Wausau orchard, 1906.
Cankers covered with white lead after being scraped and disinfected.

that kind of soil that it is of no earthly use to plant an orchard. This orchard has been abandoned.

Last spring one hundred trees were planted on the farm of W. H. Adams, about three miles from Eagle River, on high land with a good clay subsoil, and arrangements were made with Mr. Adams for the planting of two hundred more trees, making three acres in all, but the deal has fallen through owing to the failure on Mr. Adams' part to prepare the land and also his failure to sign a contract. It seems to your committee that an orchard ought to be located somewhere in this vicinity, provided a good location can be obtained, and if it can be made to succeed our efforts at this place are likely to be as valuable (and probably more so) as at any of the other points.

REPORT OF SUPT. OF TRIAL ORCHARDS.

F. CRANEFIELD.

My report as Supt. of Trial Orchards will be comparatively brief as the chairman of the Trial Orchard Committee reports on this subject. During the year I visited the Wausau orchard four times, Poplar three times, Eagle River twice and Medford once. The plan of culture followed in other seasons has been continued the past year, viz., cultivation during the early part of the season followed by cover crops. The unusually wet season interfered to some extent in cultivating but on the whole weeds and grass were kept well in check.

WAUSAU.

You will recall that my report of the Wausau orchard last winter showed continued and rapid progress of the disease known as canker during the season of 1905 and the expressed fear that if unchecked it would soon completely ruin the orchard. I am pleased to report that the canker has apparently been fully controlled, and that the orchard is in a thrifty and healthy condition. All of this has been accomplished at an expense of less than \$40.00. Perhaps we should add to this the expenses of Prof. Whetzel of Cornell University who attended our convention last winter and showed us clearly the nature of the disease and outlined the method of treatment, for it was the

information and inspiration afforded by this lecture that induced me to make a final but somewhat despairing effort to save the Wausau orchard. Two bright young men, graduates of Prof. John's agricultural school, were engaged to assist in the work. After nearly 100 of the hopeless cases consisting largely of Northwestern, Longfield and Wealthy had been pulled out and burned several hundred remaining affected trees were treated as follows: All cankered spots were cleansed by removing affected bark and wood cutting down to healthy tissues and the wounds disinfected, as directed by Prof. Whetzel, with a solution of corrosive sublimate in water; afterward covering with a heavy coat of white lead paint.

At the same time the orchard was carefully pruned, removing many affected branches. Later in the season the trees were carefully examined and such cankers as were overlooked the first time, were treated. At this time it was found that almost without exception the wounds were healing nicely. The results on the whole are little short of marvelous. Where a year ago last fall the orchard appeared to be on the road to complete destruction the trees now appeared, one year later, healthy and thriving and apparently on the way to full recovery. It is yet too early to speak definitely but should the future results justify our expectation this experience alone may prove of more value to the people of the state than the entire cost of the State Horticultural Society for the past fifty years. We have no cause to mourn over the two hundred or more trees in the Wausau orchard which died, rather we should rejoice that the opportunity was presented to demonstrate that apple canker can be controlled.

While the crop of fruit was not up to that of 1905 many varieties bore a fair crop. Concerning comparative yield, etc., I beg leave to quote from Bulletin No. 10 of this society as follows:

APPLES.

That portion of the Wausau trial orchard known as the commercial orchard originally contained the following varieties of apples: Thirty-eight trees each of Hiberna, Oldenburg, Longfield, McMahon and Wealthy; 19 each of Peerless, Newell, Repka, Okabena and Malinda; 9 each of Hoadley, Alma, Avista, Patten and Dominion. Of these the Patten has borne more fruit per tree than any other variety named, with Hiberna, Longfield, Oldenburg and McMahon next and in order

named. The Wealthy has not done well, due largely to the fact that the trees have suffered from the apple canker. The same is true of Northwestern. The Hibernial bears heavily on alternate years and the fruit is more highly colored than when grown farther south.

The Patten bears a good crop every year. The Longfield has borne heavily alternate years and a fair crop "off" seasons, but the fruit has been too small to be salable and very badly affected with scab.

Okabena bears well alternate years, the fruit being very attractive in appearance, as good as Oldenburg and sells readily. The McMahon trees have made a splendid growth but have borne but light crops.

Peerless, Newell, Malinda, Dominion and Headley have not produced more than enough fruit for samples at the fairs. Avista and Alma have not responded even to this extent. Alma may be pronounced absolutely worthless as grown at Wausau and Avista, Peerless, Newell and Hoadley must soon show results or be put in the same class.

In the "experimental" portion of the orchard two trees each of about 50 varieties of apples were planted. None of these are of special merit except Dudley.

PLUMS.

The native plums in the Wausau orchard have degenerated into common "wild" plums. Although the varieties planted are of the best, as Surprise, Quaker, De Soto, etc., in quality and amount the crops borne have been no better than could be found in any wild plum thicket in many parts of the state. This is due to lack of proper attention in cultivation, pruning, spraying, thinning the fruit, etc.

For some reason no attempt had been made to cultivate the plum orchard until the spring of 1904 and three seasons' work has scarcely sufficed to subdue the sod and bring the ground into merely a fair state of cultivation. But little pruning has been done, the sod culture system resulted in stunted trees, and the tops a mass of fruiting wood. Conditions have been such that it was impractical to properly thin the fruit, resulting in large crops of inferior fruit practically unsalable. Trees of similar varieties of native plums planted in the Marshall orchard at Madison at the same time have yielded immense crops of large juicy plums, which have sold as high as \$2.50

a bushel. All of which teaches a valuable lesson, viz., that native plums to be profitable must have high culture. Neglect produces only "wild" plums.

CHERRIES.

The original planting consisted mainly of Montmorency and Early Richmond, but other varieties have been added from time to time. All trees have made a good growth except in one low spot of ground and are well supplied with fruiting wood, but the crop has been almost an entire failure each year, due probably to late spring frosts. The results to date in the Wausau orchard are not encouraging for cherry growing.

The orchard was sprayed three times, once with copper sulfate in water at the rate of two pounds to fifty gallons and twice with Bordeaux mixture. Swift's arsenate of lead was used with the Bordeaux at the rate of two pounds to fifty gallons of Bordeaux. The second spraying if done just after the blossoms have fallen is probably the most important one of the three commonly recommended. If the work is *thoroughly* done at this time with a properly prepared Bordeaux and a reliable insecticide there is really little need of a later application.

The results from spraying in the Wausau orchard certainly paid well as the fruit and foliage were both almost entirely free from the scab and wormy apples were an "unknown quantity". The spraying received the undivided attention of your superintendent while in progress.

The question of the early abandonment of the Wausau orchard lease is one that should be carefully and seriously considered at this session. It is the opinion of your superintendent that the orchard should be held at least one year longer until the conclusion of the experiment with the canker and until one or more excursions of Marathon county people have visited the orchard. How much longer is a matter for discussion.

POPLAR.

The Poplar orchard has improved wonderfully the past year. The growth in 1905 was not encouraging and had a severe winter followed it is likely a large proportion would have perished. The season of 1906 was more favorable and the prospects are now decidedly more encouraging. Fifty-three trees died during the year of 1905 and were reset last spring. Very few died the past year.



Pit cankers on trunk of apple tree in Wausau orchard. These cankers formed at the base of blighted sap-sprouts. Hundreds of similar cases were found, July 1906.



Pit canker, above, from blighted sap-sprout. The base of a sap-sprout was found in the large canker below and the beginning of this extensive and almost fatal injury could no doubt be traced to a blighted sap-sprout. Beware of sap-sprouts!

Mr. Peterson forwarded twigs of apple and plum trees from time to time during the season and these compared with twigs from similar varieties at Madison shows that growth continued at Poplar several weeks later than at Madison. It is suggested that the methods of orchard culture must, if possible, be so modified as to check this late growth.

BARRON.

The first planting was done here last spring, consisting of one acre. The following varieties were planted: 10 Duchess, 10 Wolf River, 5 Longfield, 10 Wealthy, 3 Gem City, 3 Lily, 10 McMahon, 10 Northwestern, 5 Tolman, 5 Snow, 5 Dominion.

Plums: 5 Surprise, 5 Quaker, 5 Hammer, 5 De Soto.

Cherries: 10 Early Richmond, 10 Montmorency.

The soil and site are both good and we look forward to excellent results.

MEDFORD.

There is little to be said about this orchard but that little is encouraging. Considerable planting has been necessary consisting of 48 apple, 4 cherry and 12 plum, but the orchard is now full. Mr. Harris spends his entire time in the orchard giving it loving care.

EAGLE RIVER.

After due deliberation on the part of the trial orchard committee and the board of managers this orchard was abandoned early in July. This is the fulfillment of predictions made in my first report to this society.

In this orchard, originally containing 540 trees, over 1,000 trees have died and been reset in three years, or in other words it was found necessary to replant the entire orchard twice. But very few of the original trees now remain, viz.: a few crabs and a few native plums. Last spring most of the trees set the year before were dead and instead of replanting, steps were taken to obtain a relinquishment of the lease. Unfortunately it was not possible to accomplish this until the 10th of July. An unsuccessful effort was made to lease another site in the vicinity of Eagle River, more elevated and on heavier soil, but the orchard committee hopes to accomplish this the coming year.

MAPLE.

Concerning the sixth and newest trial orchard I quote again from Bulletin No. 10:

SIX TRIAL ORCHARDS.

The sixth trial orchard of this society has recently been located at Maple, Douglas county, on land owned by E. G. Doherty of that place. This is pursuant to action by the trial orchard committee, confirmed by the executive board. Three acres have been leased, a portion of which will be planted next spring. While the soil of Douglas and Bayfield counties, including the Poplar site, consists largely of the very heavy Superior red clay a portion, as at Maple, is much lighter and designated by soil surveyors as Superior sandy loam.

Maple is a small town four miles east of Poplar on the Northern Pacific Railroad, having an altitude of 1,277 feet, or 274 feet higher than Poplar.

A release has been granted by P. A. Peterson, owner of the Poplar site, of the portion remaining unplanted and the action of the committee amounts practically to a transfer of a portion of the Poplar orchard four miles farther east and to different soil and drainage conditions.

It has often been suggested that on account of the regular and heavy snowfalls in northern Wisconsin that full planting might succeed better there than farther south. Accordingly a few Wealthy apple trees were purchased and set in the Poplar orchard last October. The results will be looked for with interest next spring.

WEDNESDAY—MORNING SESSION.

PRESIDENT'S ADDRESS.

DR. T. E. LOOPE.

The Wisconsin Horticultural Society has a goodly number of members, a fair amount of enthusiasm, and are only paupers on the financial question. We have entered on a work of vast importance to the state. The trial orchards if carried to a

demonstration will give our people valuable information that could not be gathered in any other way, saving our citizens much time, much disappointment and great expense. This work should not be hindered by lack of interest, unkind criticism or insufficient funds. It is being carried on intelligently and honestly. Those in charge of the work are capable men theoretically and practically and are striving to attain the greatest good to the greatest number.

Our work cannot be carried forward without considerable expense but the books are always open to the fullest investigation. There is no graft in our society.

The unanimity of thought and action of the society for years past has been a source of congratulation to its officers and it is to be hoped that it will continue indefinitely.

Our winter meetings have been noted for the valuable subjects presented and the masterly manner in which they have been handled. The most progressive talent has been secured from abroad and our reports are filled with the best thoughts on every topic on our programme.

Shall we continue to be superfine or just middling?

The mills of the gods have completed their annual output. If, as it is said, their product is "exceedingly fine" we have a chance to examine the grist and take or reject a seems good to us. If we individually have been in the grind, let us hope that the slow process has developed some superfine material, something fit. Perhaps some of our selfishness has found the refuse pile. May they grind slower and finer next year. Is the greed and envy all in the dump? Shut the millstones close or it filters through and infests the high grade product. Has the foul seeds of suspicion, faultfinding and jealousy been winnowed and separated from the good grain?

Is the finished product low grade, standard or superfine?

Does it contain the quality of energetic action?

Does it have inherent perseverance?

Has it that essential, subtle elevating power called enthusiasm?

Without this element it must be but a low grade inert mass unfit for horticultural digestion, just middlings, hog feed, fit only for beasts, unassimilable by gods, producing perhaps dollars, a by-product, having no value in promoting health, brain food or happiness. Without enthusiasm the thrill of great satisfaction is overpowered by the Ptomaine of greed and selfishness, fatal to soul development. Many people live on middlings and grow gross and unwieldy on dollars only.

There is another essential god-given ingredient called Fra-

ternity. Its substance was well voiced when Ben Adhem told the Angel to write him "as one who loved his fellowmen", and its quality was vouched for in the announcement, "And lo, Ben Adhem's name led all the rest."

The horticulturist should be girded with all the superfine qualities. His work deals with the most exquisite soul satisfying products of the soil. He produces the refined, bright hued gems of nature to promote goodfellowship, amiability and easy digestion. Millionaires and Mountebanks, Gamblers or Gluttons, Kings or Serfs, sing the praises of his Jewels and children shout with joy and eagerly gather around the board at sight of his treasures. He dispenses gladness, goodwill and comfortable appetites to his multitude of patrons. He is a benefactor and health giver at the same time. He gives rich blood, bright eyes, active muscles, reduces the ravages of disease and cheats the doctor out of big bills. The aroma of his fruits was caught in the garden of Eden, the flavor from enchanted islands of tropical seas, the coloring from the gorgeous sunsets of fairyland.

The horticulturist often has no need of pockets, while those of the commission man and railroads are bulging but he at last goes to Heaven and they go to banking. His habitat extends from Alaska to the Philippines, from California to Porto Rico in our possessions and even the Minnesota Horticultural Society, strange as it may seem, enrolls 2500 of him. There is no record of a horticulturist at the north pole but if Peary ever gets there and finds one you can wager that he will have frost plums, snow balls and ice plants the year round.

PLANT BREEDING SESSION.

BREEDING FOR HARDINESS AND OTHER DESIRABLE QUALITIES.

CHARLES G. PATTEN, Charles City, Iowa.

What is hardiness? It is not that quality, or character, that fits a plant or tree to endure. Have we put into the word hardiness, the full meaning of the thought that we would like

to express? Have we not too much confined our thought to the fact, of trees or plants enduring a low winter temperature?

That is the meaning as I understand it that we have given to the word hardy, or hardiness.

But that does not answer our purpose, we have only covered half of the year. The transcendent scab for instance may be uninjured by a temperature of forty degrees below zero, and blight nearly to death the following summer.

Other trees and plants may endure the winter, but have their leaves so weakened and injured by unfavorable summer conditions, that they are rendered unfruitful and valueless.

If such are the facts, then we must either enlarge the meaning of the word hardiness, or what would be far better substitute the word adapted, for it; for that means, to fit; or suited to the climatic conditions of the whole year.

For instance, a plant or tree may be wholly adapted between the latitudes of 42 and 45 along the Mississippi river, and be wholly unadapted in the same latitudes along the Missouri.

So it is the business of the horticulturist to breed trees and plants that are adapted to the conditions where they are to grow. Even natural forest trees vary greatly in their power of adaptation.

To illustrate this fact it will be only necessary to direct attention to two species of trees. One the White Beech, that grows into such grand proportions within twenty miles of Lake Michigan north of Milwaukee, and which is made to live with great difficulty here at Madison. I once tried it ten miles north of this city where it almost wholly failed to grow; and at my home in Iowa, one tree out of fifty in a period of fully twenty years has attained a height of only five feet; the other forty nine are dead.

While *Catalpa Speciosa*, the native home of which is in the lower part of Indiana, Illinois, Missouri, Tennessee and Mississippi, along that great river and its tributaries between latitudes $32\frac{1}{2}$ and $37\frac{1}{2}$, in a climate that is very mild and having abundant moisture.

Today, even with the most indifferent selection of seeds, this tree is becoming adapted to this locality and Northern Iowa; many specimens appearing but little less adapted to this latitude than other species of our forest trees.

If almost unconscious selection can breed in so short a period, so much hardiness, or adaptation into a forest tree, that it will thrive in a prairie climate three to four hundred miles north of its native home in a wilderness, is it not the most as-

surging evidence that we can breed hardiness into our highly domesticated fruits.

Professor Bailey says "We know as a matter of common horticultural experience that any change or variation in any organism may become hereditary, or be the beginning of a new variety". Again, "plant organism is plastic by nature and quickly responds to every touch of environment".

Mr. Burbank says "every characteristic can be enlarged and improved upon; leaf, flower, size, color, form, fragrance, and the size and shape of the trees and plants which produce them".

Darwin says "slight changes in the conditions of life add to the vigor and fertility of all organic beings". Hardiness in plants is analogous to endurance in the animal. It is the especial character that fits it to persist; to live.

A tree is hardy because it has a constitution which adapts it to the climate and soil where it grows; whether in the desert, in the forest, on the mountain top or in the valley, either north or south.

It then becomes the business of the plant breeder to find out by experience and observation the trees or plants best suited to his purpose. Variation is everywhere manifest in plant life. And as selection is a dominating factor, in augmenting, developing and fixing the type or character of the trees that we aim to secure, he will select no inferior tree for either parent; only those individuals or varieties that come nearest to his ideals, whether of crossed or pure seedlings.

Selecting from varieties that possess marked vigor, perfection in leaf, in bark, in a normal period of ripening their wood, neither too late or too early, perfect in form, free from blight, limbs strongly shouldered, productive of fine even sized fruit, and as free as possible from every imperfection; and if there is any virtue in heredity, he will not have to grow five hundred thousand, or even one hundred thousand seedlings to secure adapted varieties for the region which he inhabits.

Prof. Hugo de Vries says "some varieties are most disagreeably inconstant, while others remain as true to their type as the best species."

Mr. Theodore Williams of Nebraska, in his very numerous experiments to improve the plum, finds that the seedlings of the Wild Goose are almost wholly barren, "giving no return," as he puts it, "for their existence."

In thirty-eight years' experience in planting the seeds of a large number of different varieties of apple, I have found a great difference in the seedlings of different varieties, and also of a single variety; some giving a large proportion of strong



Seedling of Oldenburg, originated by C. G. Patten.
One of the best varieties for Northern Wisconsin on account of its hardness.

trees, free from disease, while others would be feeble growers, weak in leaf, and subject to rust and blight.

If my memory serves me right, it was in 1880 that I bought a carload of apples from your University farm, among them was some splendid specimens of the Perry Russett from which seeds were saved. Also some Oldenberg seeds grown and planted at Charles City, and to my surprise the Russett gave the largest proportion of vigorous and hardy seedlings.

In looking up the history of this variety in a work entitled "The Apples of New York," by Prof. S. A. Beach, now of the Iowa Agricultural College, I discover that this is a remarkable tree. Some trees of it growing in Onondago county, New York, nearly one hundred years old, are reported to be still very productive.

It was evidently known in Rhode Island before its appearance in New York, as it was known there as Rhode Island Russett, its identity being discovered in 1904 by our U. S. Pomologist Brackett, as being the same as the Perry Russett of the west.

Prof. Beach classes it in the same group as Pecks Pleasant, Rhode Island Greening, and Green Newton. The best of the seedlings I named "University" in honor of the place where, in fact, it originated.

It is twenty per cent more hardy than the parent tree and a most remarkably vigorous grower, maturing its wood thoroughly, and is a good bearer of fine commercial sized apples. It is doing well on the forty-fifth parallel in Minnesota, and when introduced into central and northern Wisconsin will take a place for hardiness beside the Patten Greening, and I shall look for it to be classed as a good apple. It appears to be a pure Perry Russett seedling.

I also have what appears to be a pure seedling of the Fall Orange that is far more hardy than the parent tree, while the fruit resembles it closely, and is nearly as good in quality.

The Iowa Beauty, well named for both tree and fruit, is a seedling of the Golden Russett, that I have felt sure was a cross with the St. Lawrence. It is a magnificent tree and nearly if not quite as hardy as the Oldenberg.

Another tree, a seedling of the Ben Davis, and an undoubted cross with the Jonathan, is more hardy than either parent, is quite a good keeper, and a fine eating apple. Another pure seedling of the Ben Davis is fully twenty per cent more hardy than the parent tree.

Still another tree, a seedling of the Fameuse, planted in 1881, is fifteen per cent more hardy than the parent Fameuse,

and the hardiest of the Fameuse seedlings, except the Canada Baldwin. It is a third larger than the Fameuse, quite uniform in size, a very brilliant color, and of a mild, pleasant flavor. Was the first premium seedling at the Iowa State fair in 1896.

I might enumerate farther, but will only say that long experience confirms the opinion that climate and soil influences will breed hardiness or adaptation independent of cross-pollination.

Call these notable exceptions what we will, "mutations," or "breaks in hereditary action," they are but the natural and marked expressions in plant life, of the cumulative forces of culture.

Referring now briefly to some of the artificial crosses that have been made at Charles City, will say that Pink Annis crossed with the Jonathan sixteen years ago, has given very unsatisfactory results. One cross of Jonathan and Duchess, is sweet, but almost wholly unproductive.

Two crosses with Jonathan and Gideons Mary are sweet, quite good and fairly productive, showing that there is a sweet apple close up in the pedigree of the Jonathan.

A few crosses with Wolf River and Brier Sweet have given some remarkable variations, all colored, but nothing of special value except for farther experiment.

Brier Sweet is a first cross with the Bailey Sweet and the Red Siberian; and when crossed with the Pound Sweet, has varied in size and color, but all are sweet.

In this last cross there are sixteen years of valuable experience in breeding for the State Experiment Stations.

Many other crosses were made, a few of them promising; twenty or more varieties being used.

Fourteen years since a good many crosses were made, perhaps those of the Grimes Golden and Patten Greening are the most noticeable, all are yellowish, or from light to dark green, except one having a bronze cheek.

All are of good size, some of them very smooth, and remarkably uniform in size. Some of them good, but none of them as high in quality as the Grimes; but one of them is a good keeper, and was awarded a first premium at the Northern Iowa meeting one year ago.

Working nominally as a State station, always under pressure of other work in the blossoming season, and with little encouragement at its inception except from our now U. S. Pomologist, Col. G. B. Brackett, and a few others, with almost no financial aid, this breeding work has been hard work, and slower in its

development than it need have been under more favorable circumstances.

It was undertaken at a time of the almost universal belief that Russia held in store about all that was needed in our northern horticulture, as well as against the authoritative assurance that it would take from three hundred to a thousand years to procure a seedling of the hardiness of the Rauls Janet as hardy as the parent; which opinion was disproved, both in the first and second generations of undoubted pure seedlings of the latter variety.

And now in closing, and in view of the great work at both state and national experiment stations that has been inaugurated in the last few years in the breeding of fruits, I doubtless will be pardoned for referring briefly to a paper on "Experimental Horticulture" presented to the Iowa State Horticultural meeting of 1881, wherein I said, "Everything that begets life, whether animal or plant, stamps in a greater or less degree the impress of its individuality either upon its immediate or remote offspring.

"Had we acted in harmony with this law by planting generously the seeds of our very best fruits, we should now be less frequently challenging the wisdom of Deity in giving to this northwestern region its peculiar climate.

"Again I repeat, that the crowning error of our experimental horticulture was that we did not plant, and continue to plant the seeds of our hardiest fruits from 1856 to the present time."

Continuing I practically outlined the views that are now generally accepted in this breeding problem, showing that "hardiness or ability to endure the climate is the first requisite everywhere," and that the latitude of southern Iowa demanded that we combine the characters of different varieties, from those that were needed in central and northern Iowa and the latitude of St. Paul.

And from a paper on "Plant Breeding" in the report of 1885 I used the following words: "If I could send a voice that would go ringing through the harvest days of our fruits for the next fifteen years, and could make it so melodious and attractive that the harvesters would stop, listen, and obey, saying, 'Save the seeds of the largest, most perfect in form, most beautifully tinted from the finest bush, the strongest and most fruitful vine, from the hardiest and best tree, of the most delicious fruit of every kind, and plant, and replant the best in every county and voting precinct in Iowa, the work would be accomplished.'

"I could close my paper and this horticultural society could adjourn its labors and reassemble in the year of our Lord 1901

to witness a grander improvement of fruits than the world has ever seen in a half century of its progress."

And now again in closing this somewhat lengthy paper allow me to add, that with our present knowledge of the laws of breeding, and our knowledge of the leading families of apples, we can produce the color which we desire in seventy-five out of one hundred seedlings grown.

And that we can breed with reasonable assurance the form fruit, and uniform size also. And I go still farther. We can breed not only commercial size, but so uniform that there will be almost no culls.

It is true that your speaker is only a pioneer, making very little claim to scientific knowledge, but so far as my experience and observation in cross-breeding goes, I am convinced that at least with our fruits the male parent dominates in the cross; in color of fruit, in form of fruit, and in form of tree.

And in saying this I am not unmindful of the force and power of heredity; that a balanced force, and especially a prepotent mother would not in some degree change such results; but it would be only the exception; this statement does not, however, include hybrids between mongrels and fixed species.

Mr. Melcher: I would like to have Prof. Patten explain the difference between a hybrid and a mongrel.

Mr. Patten: A mongrel would properly be a cross between ordinary varieties, common varieties and unknown varieties, like an ordinary seedling that we would pick up anywhere in our orchard. A hybrid would be a tree between a known variety, a common apple and a Siberian crab.

Prof. Sandsten: I would ask that the discussion of this paper be left until the whole subject has been presented. I think discussion comes in more freely when we are through with the papers.

The President: I am going to call on Prof. Sandsten to outline his theory as to plant breeding.

SOME PROBLEMS IN PLANT BREEDING.

E. P. SANDSTEN,

Professor of Horticulture, University of Wisconsin.

The term "plant breeding" may be defined as the science and art of mating related and unrelated plants with the object of obtaining new individuals possessing certain characteristics.

Of late years the term has been used indiscriminately by nursery men and seed growers to impress their patrons with the quality of their products. These persons are not plant breeders in the true sense of the term. They have merely practiced plant selection more or less rigidly, and through such selection have obtained seeds or plants of uniform quality and fairly well fixed characteristics. Not only has the term "plant breeding" been abused, but other terms, such as pedigree, heredity, atavism, etc., have been and are employed without regard for their real meaning. Quite often we pick up catalogs of plant growers with glaring head lines that they grow only pedigreed plants. Pedigree in the sense used by these persons does not mean that plants have record of ancestors back to some definite starting point but rather that the plants so advertised were produced by selection of certain individuals which have been increased by the usual methods of plant propagation, so there is really no record or pedigree in the true sense of the word, but merely a picked strain of a given variety. This promiscuous use of terms has led to a misunderstanding of what plant breeding really is and what it stands for.

In dealing with plants and animals we are dealing with the complex and little understood phenomena of life, and in dealing with life, as such, we should always be conscious of the fact that while several laws regarding the behavior of organisms under certain conditions have been formulated and can be applied, there still remains some of the ultimate questions which neither science or philosophy have as yet been able to solve. It is important that we should recognize our limitations when confronted with the ultimate problems and frankly acknowledge our limitations and ignorance.

Heredity is said to be the corner stone of plant as well as animal breeding. Heredity is the law that governs all organic life in so far as the parents transmit their likeness to their offspring, or in other words, the law that "like begets like." Without any assurance that like begets like, plant and animal breeding would be almost impossible. Yet, while we accept this doctrine in general, we should not be too strict in its interpretation. Observation has taught us that it is impossible for like to produce like; that likeness in the exact sense of the word is impossible in nature. Individuals differ in minor characteristics, no matter how careful the breeder is. In fact, likeness is the essential for the survival of existing forms and new forms in the world. Unlikeness is also necessary for the process of evolution to work out its destiny. In the struggle for existence in which

all plants and animals are engaged under natural conditions, the surviving individuals are those which are most unlike their neighbors. However, for practical purposes the law of heredity as defined holds good and may be relied upon by those engaged in plant breeding.

The word "pedigree" is the record of ancestors dating back to some prominent individual or individuals. It is the family record and a record of breeding.

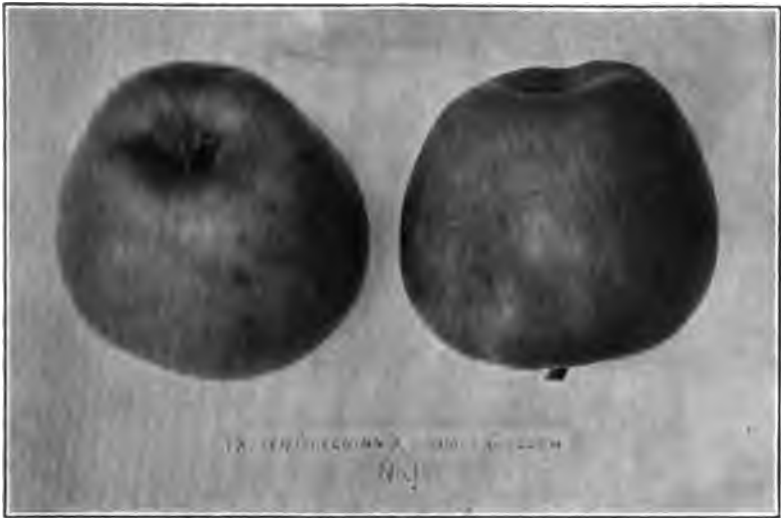
The term "atavism" is employed to express the sudden appearance of characters which previously existed in the ancestors but which have been suppressed and laid dormant for a shorter or longer period of time.

"Sport" is the term used to designate the sudden appearance of a new form or some marked characteristics which have not previously been known to exist either in the immediate or remote ancestors, hence of which no records have been kept. The similarity in meaning between the term "atavism" and "sport" should be recognized, and the only reason for using two terms is that the sudden occurrence of old characteristics may be found to be recorded in the history of the ancestors, hence they may be traced back to their origin, while in the case of an appearance of a sport, no records or characteristics possessed by the sport can be found in the pedigree or record of its ancestors.

By the term "struggle for existence" we mean the competition which plants and animals are engaged in under natural and unnatural conditions. This struggle for existence, which in almost all cases is a struggle for food, is the battle ground where plants settle the supremacy in a way not unlike the warfare of nations. The stronger always prevails over the weaker. This struggle for existence is a factor in plant evolution and can be studied by anyone who cares to watch the warfare between plants for possession of a certain vacant piece of ground.

"Prepotency" is the ability of a plant to impress its characteristics in a marked degree to its offspring. The ability may or may not be dependent upon the physical vigor or upon general conformation of the individual. It may in a measure be accounted for by supposing that the prepotent individual has a long line of pure-bred ancestors, thus possessing a preponderance of pure germ cells.

The purer the breeding the more certain are the results. The fixation of type is less important when we are dealing with plants which are propagated by cutting, grafting, budding, or by any asexual method, since in such case the original parent individual is propagated and retained, while with plants propa-



"Almost an exact duplicate in form, color and season of Grimes. Of 18 crosses, five like Greening, thirteen midway between." C. G. Patten.



Iowa Beauty apple, seedling of Oldenburg, originated by C. G. Patten.

gated with seed the necessity for fixation of type is very important.

The degree of instability of the first hybrid offspring depends in large degree upon the violence of the cross or upon the affinity of the plants mated. This affinity is not necessarily based upon close or remote relationship. The belief that close or remote relationship is necessary to success in plant breeding is slowly passing away. The term "relationship" has been much abused both by botanists and horticulturists, since relationship is based mainly upon similarity of structure. A number of experiments have demonstrated that successful breeding or crossing is not confined to within the limits of relationship.

There are both chemical and morphological differences in plants which must be considered by the breeder, such as difference in length of pistils of the two plants to be crossed and differences in the various floral parts are very important. It is conceivable that if the pollen from the plant having short pistils is transferred to a plant having long pistils that the pollen tube will not grow long enough to reach the egg cell. In other words, the growth in length of the pollen tube of a given plant is limited to the requirements of that plant.

Then there are obstacles which are of a chemical nature, such as chemical differences in the cell sap which prevents the proper germination of the pollen. This phase was carefully studied six years ago, and the result of such study showed wide range of sugar contents in the juices of the stigma and the style. Apple pollen was found to germinate best in five per cent sugar solution, plum pollen in four per cent, American plum pollen in three per cent, peach pollen in five per cent, common berry pollen in four per cent, plantain pollen in two per cent, sour dock pollen in thirty-five per cent, and clover pollen in forty per cent. These variations show conclusively the chemical requirements in the pollen for germination. Further, it shows that these requirements must be taken into consideration in breeding. To be sure the average breeder does not nor perhaps need not take into account these questions. But to those engaged in strictly experimental breeding these principles help to explain the many failures which meet us on every hand.

There are two main factors responsible for variation among plants, both wild and cultivated, namely environment and sexual mixing. Under the term environment, we include all of the external factors that in any way affect the plant, such as soil, climate, cultivation, plant food, etc.; under the term sexual mixing the influencing of crossing and hybridizing.

With the work of Weisman and the revival of Mendel's work

and last with the mutation theory of DeVrie, heredity has been the center of attraction among both plant and animal breeders. The work of these men has had a tremendous influence upon scientists, and disciples are not wanting—in fact they are numerous.

It is not my purpose to discuss the views as set forth by these men, though I feel very strongly that as horticulturists many of us cannot fully agree with many of their statements. Heredity may be the breeders' cornerstone, and undoubtedly is, though speaking figuratively a corner stone is not indispensable to a building. I remember distinctly when Weisman's work was first published what a storm of protest arose from many horticulturists and scientists, and how later many modifications were made by Mr. Weisman to make his theory fit the cases which were brought up against it. His argument for the non-transmissibility of acquired character was, and is, especially obnoxious to many since it does not agree with the experience of men engaged in actual work. Without entering into a discussion of the biological side of this question, I venture to say that the transmissibility of acquired character both upon plant and animal life has been fully proven. And, further, that the transmissibility of acquired character is the most vital factor in the development of plant life, both in nature and in cultivation. Mere verbal subterfuge does not alter the fact that acquired characters are transmissible and, further, that environment is a factor which must not be overlooked by plant breeders. The saying that "we are all creatures of circumstances" has more truth than poetry in it. Further, it is both reasonable and probable that plant and animal life as it appears on the planet to-day is a result of the slow acting environment. Even the DeVrie theory of mutation resolves itself into the action of environment upon the dormant or latent characters, which in such action gain the ascendancy over the dominant or active characters and mutation occurs, and a new form of plant life is created. Call it mutation, or any other name, the fact remains that the environment is the controlling factor in the transformation. Under cultivation mutation is more common than in nature, simply because the chances in the environment are greater and the plant responds more rapidly.

We are in the habit of speaking of adaptation as something entirely apart from variation. Adaptation stands for the slow changes induced by the environment. If the existing plant forms are largely the result of adaption to the ever changing environment, then we have strong evidence that this adaptation or variation of plants can be utilized to considerable advantage

by the horticulturist to acclimate plants which are not hardy to our climatic conditions. I fully realize that this view will be criticized and derided by those who have experienced losses and disappointment in the growing of fruit trees not adapted to our soils and climate. It may, to be sure, require a longer period of time than is allotted to a single person, but we should bear in mind that we are not working for this generation, but for the generations to come. Further, I am not quite convinced that the sad experiences of the past are of sufficient argument for us to draw the sweeping conclusion that results cannot be accomplished within the span of one person's life. The large number of old eastern apples trees now growing in the eastern and southern part of Wisconsin are eloquent witness to the kind of adaptation I have spoken of. Not only this, but those trees are old and have stood the test of the most severe winters on record. I do not mean to say the eastern varieties can be grown successfully all over the state, but I do say and believe that certain sections along Lake Michigan are adapted to many of these varieties. As a further argument, I would mention the adaptation that the corn plant has undergone within the last ten or fifteen years.

Fifteen or twenty years ago it was considered impossible to grow corn in the central part of this state or central Minnesota, while we have varieties today that have proven quite hardy and adapted to these sections. If it be argued that this has been accomplished through breeding, which is in a measure true, there may also have been adaptation to the environment as the parents of these varieties must have originally come from a more southern climate.

In conclusion I wish to say that I am not arguing against heredity as a factor in plant breeding and plant development, but rather I wish to emphasize the influence of environment, as it is to my mind one of the most important as well as the most neglected forces which operate on organic life. Nor do I wish to belittle or deride the work of Mendel and others, though we may question the application of some of their theories and laws in breeding, for every discovery and every contribution to the subject of heredity and other factors associated with plant breeding will do much to encourage a further study of this subject and aid us materially in a more intelligent pursuit of breeding.

BREEDING HARDY FRUITS.

PROF. N. E. HANSEN, State College of Agriculture and Mechanic Arts, Brookings, South Dakota.

The main elements to success as I see them, in this part of prairie horticulture, are: 1. Not to be satisfied with plants as we find them but to use them as starting points for a nobler race; 2. To work with Nature and not against her—"to hitch my wagon to a star" but to be very careful to ascertain first which way the star is going; 3. To lay the whole world under tribute for materials.

Now for some principles underlying this work:

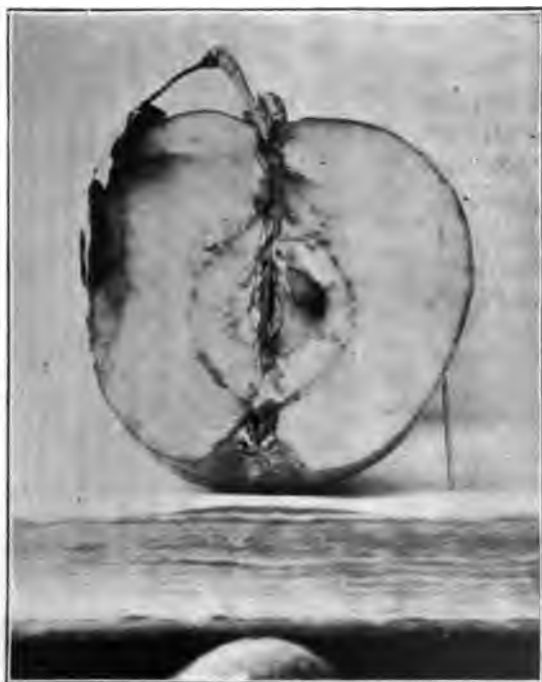
REASONS FOR GATHERING NEW MATERIALS.

For the vast prairie region west of the Missouri river, from Texas to Manitoba, we especially need plants that are drought-resistant. The mistake has been made hitherto to take for granted that fruits, trees, grains, grasses and forage crops brought over by the early settlers from the mild regions of western Europe, a region of abundant rainfall, are those also best adapted for semiarid conditions of soil and climate. We now realize that we should take advantage of the work of ages of selection in the dry regions of the old world, and import anything of promise. Secretary Wilson, of the United States Department of Agriculture, has sent men to the ends of the earth to secure plants adapted to the varied conditions of our country. That the philosophical basis underlying this work is sound is acknowledged by all who have investigated the subject. This does not mean that we should neglect our native species. On the contrary, we should explore our own wilds as much as the wilds of Europe, Asia, Africa, South America, Australia, and the islands of the sea. Then, when the ends of the earth are brought together, by making wise use of the new light in heredity revealed to us by Mendel and De Vries, we can obtain new plants combining the desirable characteristics of these various races.

As the first agricultural explorer sent out by the department, I made a trip in 1897-'98 of nearly ten months to Russia, Transcaucasia, Turkestan, western China, and Siberia. Over



"Cross of a Pippin apple and Soulard crab. Presented to the writer by A. G. Tuttle in 1873. Believed to be the first cross of the wild and cultivated apple." C. G. Patten.



Cross section of above. From photographs dated 1889.

five car-loads of seeds and plants were brought back, including the Turkestan alfalfa, which has proven more resistant to cold and drought than the ordinary form of alfalfa, which was brought over by the Spaniards from northern Africa. The trip involved an overland journey in Asia of 1,300 miles in a wagon and 700 in a sleigh, the latter in the endeavor to reach the Siberian railway after snow came to check further work in exploration.

To explain my interest in fruit-breeding, I will say that since September, 1895, I have been working along this line at the South Dakota Experiment Station, coming to that state from Iowa, where eight years were spent with Prof. J. L. Budd, of the Iowa Agricultural College, and four years in commercial nursery work. Three years ago I had over a quarter of a million fruit seedlings on hand; I have not had time to count up lately. Many thousands of inferior seedlings are destroyed each year by fire. The material on hand includes native fruits from the Dakotas, Manitoba, Assiniboia, and other regions of the prairie Northwest, the best cultivated and native species from other parts of the United States, and from many countries of the old world. It will be readily seen that the possible number of combinations is endless. I will not weary you at this time with a full account of the work under way. My view-point was broadened by a horticultural study trip in the fall and summer of 1894 to Germany, England, France, Sweden, Denmark, Belgium, Russia, and Austria, followed by the exploring trip just mentioned. In August, 1905, I had the great pleasure of visiting Luther Burbank, of California, who is the acknowledged leader of us all in the field of inventive horticulture. I use the word "inventive" advisedly, because plant-breeding corresponds to the work of invention in the domain of the mechanical industries. Burbank above all men that I have met knows best how to make use of the old principle Darwin laid down: "Excess of food causes variation." And he is wonderfully skillful in detecting promising variations at an early stage of the plant's growth.

DE CANDOLLE'S LAW.

De Candolle writes, in the "Origin of Cultivated Plants": "The northern limits of wild species . . . have not changed within historic times, although the seeds are carried frequently and continually to the north of each limit. Periods of more than 4,000 or 5,000 years, or changements of form and

duration, are needed apparently to produce a modification in a plant which will allow it to support a greater degree of cold." This shows that the constitutional ability of a plant to endure a greater degree of cold cannot be changed by selection alone.

However, we know that nature has done a great deal of work in adapting plants to varied conditions of heat and cold. We know, by costly experience, that the box-elder from the far South and East winter-kills at the North, while the local form of the box-elder, which appears to be identical with it in all respects, is perfectly hardy. The Red cedar from the South is tender in northern Iowa, while the local Red cedar is hardy. Very many instances might be given from the experience of Northern nurserymen in America and government foresters in Russia. All this shows that such a work of adaptation by selection is possible for Nature working through ages, but is not a practicable piece of business for man to undertake. Conversely, I believe it to be a mistake to attempt to adapt plants from far North south of their natural limits. Professor Munson, of Texas, has found that our Northern *Americana* plums winter-kill in Texas, as they start too early in the warm spells of winter, which do not wake up the native species of plum. Russian foresters have found the Siberian larch tender in southern Russia, because they start too early; that is, they wake up earlier than the Southern form of the larch, and are caught by late frosts.

MEDEL'S LAW.

I will refer only briefly to the vast possibilities of this law. Mendel discovered that in crossing plants the characteristics are transmitted as a whole instead of being split up into intermediate forms, and that the rearranging of the characteristics appears to follow the law of chance; also that some hybrids can be bred true to seed. In fact, they are fixed in type at once but a little time is needed to separate the prepotent forms from those not prepotent. But in the case of our fruits we only need one individual, as we can propagate it by division later. It could be fixed from seed by carrying out the law, but this would hardly be necessary, except where it is necessary to propagate plants from seeds. This means that if we make crosses enough we will be apt to get an individual having any desirable combination of characteristics.

QUETELET'S LAW.

This law holds that any possible variation or sport will occur by the law of chance only in so many hundred or thousand

times. Hence, if we only have seedlings enough we will get the desired variation. This means that the larger the number of seedlings the quicker the results will appear.

DE VRIES' THEORY OF MUTATION.

Doctor De Vries, of Holland, after working for twenty years with over 100 species of plants, very recently startled the world of science by adding something to Darwin's theory of evolution. Instead of new forms originating by very gradual, imperceptible changes, the changes occur by steps or leaps. This is evolution by saltation—by hop, skip, and jump, so to speak. I have illustrated it by saying we must now consider evolution to be a kangaroo and not a snail. The changes that were formerly thought to necessitate thousands of years for completion may need only a few generations. In fact, a new species of plant or animal may appear suddenly, full-fledged, like Minerva from the head of Jove. This wonderful conception may only be alluded to here, but it has put a new light upon much of our experimental work, and we owe a great deal to Doctor De Vries for his persistence and genius in working out this new law of heredity. The modern plant-breeder rides in an automobile on the highway of evolution, and for the North, at least, the four laws just mentioned may be considered as four of the most important cogs in the machinery, if not the four main wheels.

HOW TO SECURE HARDINESS.

It is now quite evident from a survey of the whole field, that hardiness cannot be obtained by selection alone. This is the work of nature, not man, to undertake. It is unprofitable for him to begin a labor that takes many thousands of years for completion. But hardiness can be obtained by crossing with a hardy species. In other words, we can secure perfect hardiness of plant and excellence of fruit in the same variety.

As to hardiness being a Mendelian character, I know not. In our work of selection hitherto we have insisted on large size and good quality of the fruit as well as hardiness, which has compelled the destruction of thousands of inferior-fruited seedlings which were hardy, and in plants propagated by budding and grafting it has not been necessary to fix the type. That hardiness can be transferred by crossing with a tender species now admits of no question. For example, my hybrids of the wild prairie strawberry with the French ever-bearing type,

survive, while those of the French parental type winter-kill. The hybrid of western sand cherry with a Chinese apricot plum is hardly while the Chinese species (*Prunus Simoni*) is winter-killed.

The question arises, "What is hardiness?" Some fifteen years ago the Iowa State Horticultural Society had an investigation conducted to determine the nature of hardiness in the apple. Chemical examinations were made of the wood of hardy and tender varieties; the cell structure was examined under high powers of the microscope and the number of palisade cells in the leaf was investigated. All led to negative results. It would be a great advantage to be able to determine by chemical or histological examination as to whether a new variety of apple would prove hardy in our test winters, but we must regard the problem as unsolved. Hardiness can be transmitted; it is something intangible to superficial examination, but inherent in the plant itself.

The United States Department of Agriculture has extended the citrus fruit belt northward by hybridizing the cold-resistant *citrus trifoliata* of Japan with choice sweet oranges. This work is of the greatest possible value and incidentally illustrates this same possibility of hardiness being imparted by crossing with a hardy species.

APPLES.

The cultivated apple is a native of the temperate regions of Europe and Asia, and has been with us since the dawn of history. During that time it has been greatly improved in size of fruit, but it appears mainly to have been by the process of long-continued selection under cultivation. It is only in recent years that much attention has been paid to directing the work of improvement. Some people maintain that we should depend upon chance for all our improvement with the apple and other fruits, but this strikes me as being the lazy man's way of looking at it.

That our apples are not perfect may be seen from the low quality of some of our standard market winter apples. What a libel on the fair name of the apple some of them are as far as table quality is concerned! Some of our fruit-men say we should pay attention only to large size, high color, and long winter-keeping capacity. That quality counts for little with the general public may be true; it is nevertheless a fact that many consumers are beginning to discriminate in the market against poor quality of apples.

Not only do we need better quality in our market fruits, but also greater powers of resistance to the various fungus and insect diseases. Some varieties are practically free from scab. Other varieties are nearly free from blight. I have seen certain apples top-grafted with scions from the same tree; one would scab very freely and the other would resist scab. What is the use of using the squirt-gun on apples when we can get a variety that will resist scab? It is just as sure that we can get resistant varieties of apples as can be. I do not mean that we can invent a flawless type, but I do mean that within certain limits we can get a resistant apple.

The Northern Spy apple root was found to be resistant to the woolly aphis in Australia, and so on through the list. Here is food for thought and material for experiment. Over a large region of the west and southwest, where midsummer conditions often obtain during the late fall, when winter apples are receiving the finishing touches on the tree, it may be that we will not be able to supply winter apples without cold storage. The present race of cultivated apples demands a cool fall in order to keep long during the winter. Apple buyers know that the winter apples from Michigan and New York keep better than those from the southern states of the same varieties. Hence, it may be necessary to introduce a little blood of the wild American crab of the Mississippi valley, which, in spite of hot autumn weather, are true winter keepers. As for seedlessness in apples, there is no more reason why we should not have a seedless apple than a seedless orange, and the latter is already an accomplished fact. Nature has pointed the way by giving us seedless apples for at least 2,000 years past. None of them, up to date, however, have proven to be of any market value, being too poor in quality of fruit or having other undesirable characteristics.

There is a limit to the northward extension of the cultivated apple (*Pyrus Malus*) even by the hardiest representatives of the Russian race. This is very likely determined by the cold-resistant capacity of the indigenous race of *Pyrus Malus* in Russia itself. To extend the apple limit northwestward it will be necessary to hybridize with the pure Siberian crab (*Pyrus baccata*); this is now being done in many places. The work of Thomas Andrew Knight one hundred years ago in England would help in this work were it possible to find the hybrids of this ancestry which he originated at that time. However, from the thousands of seedlings of this parentage so far produced by design or as chance seedlings in the United States, we have not secured the winter-keeping capacity which is so greatly desired. To illustrate this need, I may add that the Minnesota

State Horticultural Society has offered one thousand dollars reward to the one who will originate an apple equal in hardness to the Duchess of Oldenburg, in size and quality to Wealthy, and in winter-keeping capacity to Malinda. So far the prize has not been awarded.

PLUMS AND CHERRIES.

For the prairie regions of the west some of the native species are eminently worthy of our consideration. At the north the native *Prunus Americana* plum reigns supreme, after plums from many parts of the world have been tried and found wanting. In a horticultural exploration tour along the Missouri river in the fall of 1904, near the north line of the state, I found a tree bearing plums one and three-eighths inches in diameter, and this is right in the wilds; under propagation the fruit will be considerably larger. The *Americana* plums, as represented by the best named varieties, are of excellent table quality.

So far I have fruited fully 6,000 plum seedlings of pure native parentage with some promising varieties as a result.

That our native cherries are susceptible to improvement may be gathered from the fact that in the plum-hunting trip just mentioned, I found bushes bearing fruit very nearly free from astringency, and much larger than the ordinary.

In the work of developing plums and cherries, the question as to whether pure-bred seedlings will in the end be better than hybrids with Japanese or European plums remains to be determined. In all such work, it must be remembered that the best results may not come from the first cross. Burbank has originated choice plums containing the blood of as high as six species.

STRAWBERRIES.

I am not sure that we have the best stock of the strawberry for this region. Our strawberries, as you know, are mainly of South American ancestry, with possibly a little blood of the wild Massachusetts and other eastern strawberries. The South American strawberry gave us large size but poor quality. Our wild berries are unexcelled in quality. Why not see what can be done with the local form of the strawberry from the driest part of the west? In Dakota I find trouble with hardness. After testing many varieties of standard strawberries, I discarded them in favor of crosses of the wild and tame. From 8,000 cross-bred seedlings some 225 were selected and given

further field trial. Last fall three acres of these seedlings were plowed under after selecting the best few for propagation. Two varieties have been sent out for limited trial elsewhere. The strawberries were never mulched; so have endured forty degrees below zero with the ground bare. They are my first approach toward the ideal "Farmer's Strawberry."

RASPBERRIES.

The history of the raspberry in the United States has been one of vicissitudes. The raspberries of Europe failed in the eastern states. The wild berries of the eastern states were next taken up and developed, and, under cultivation, soon gave us improved varieties. These were crosses of part native and part European parentage, giving us our present list of raspberries. But why should we be content with the work that is done in the eastern states? It stands to reason that our western wild type of the raspberry will be better adapted to our conditions. In South Dakota I have fruited thousands of raspberry seedlings, part of them wild seedlings under cultivation from various parts of the prairie Northwest, and part crosses of the wild and tame. I now have varieties of good size and quality which have endured forty-one degrees below zero without protection. One of these I sent out last year for the first time under the name of Sunbeam, because it appeared as a sunbeam when the outlook for hardy raspberries was dark.

HORTICULTURE ON CRUTCHES.

In conclusion, let me add that I do not believe in cultivating plants unadapted to our climatic extremes, and that must be coddled. Don't let us have our prairie horticulture on crutches longer than is absolutely necessary.

But we must deal in large numbers. From the ashes of millions of seedlings must arise, Phoenix-like, the "new creations" which will dominate our prairie pomology.

DISCUSSION.

Mr. Richardson: I would like to ask Prof. Hansen if he succeeded in getting a raspberry that will stand the temperature he mentioned?

Prof. Hansen: Yes, the Sunbeam, which endured 40 below zero one winter and 41 the next without being laid down, but the female parent was a wild red raspberry from Cavalier

county, North Dakota, on the Manitoba line, and the male parent was Shaffer's Colossal, a purple-colored New York variety. In fruit it favors the Shaffer's Colossal, but the plant sprouts freely. It has never shown the least sign of winter-killing; in hardiness it appears equal to that of the native wild parent. Now, the point is this, I believe you can get any combination of characteristics in one plant, including hardiness, by making crosses enough. As for an Indian corn that will endure cold, none is known; but the season has been shortened. In Northern Europe where they have cool summers Indian corn is raised as an ornamental plant, they do not attempt to raise it as a cereal. If you can originate corn that does not need semi-tropical heat for a short time, you will do more than the Indians did. They carried corn north on this continent from Central America and Peru where it grows twenty feet high, and takes seven months to ripen, northward by selection for early maturity up into Manitoba where it ripens in three months and grows five feet or less. It is simply shortening the season; they have never originated a corn that will endure cool nights and cool days, it must have a high degree of heat during a part of the time.

Mendel's law opens up a wonderful field in animal and plant breeding, a field so great that we realize but dimly its possibilities. For instance, in my visit to Cambridge University, England, last summer, I found they had taken a wheat very susceptible to rust but productive, crossed it with a rust resistant variety from Manitoba, and both of these desirable characteristics were combined in one plant; furthermore, the rust resistant characteristic was transmitted according to Mendel's law. Mr. R. H. Biffin also crossed the best variety of wheat from Manitoba that has excellent milling quality with a very heavy yielding variety of English wheat; and secured these two good characteristics on one plant. It will probably revolutionize the wheat culture of England. Dr. Boteson and his many assistants at Cambridge University, England, maintain that you can get any combination of characteristics in one plant, providing they do not conflict, if you hybridize enough.

Sometimes striking variations appear in seedling plants which are not transmitted to the next generation. These are termed fluctuating variations. Genius in human history is usually a fluctuating variation; it is not a mutation, because it is not transmitted. So it is with plants, certain characteristics appear that cannot be transmitted from seed. Seed of a choice apple, for instance, may give us seedlings running back to the wild crab of four thousand years ago. Hence we must propagate apple trees by grafting or budding and not depend on the seed.

Mr. Patten: Do you believe that you can breed for form of leaf and plant—any character of leaf and plant?

Prof. Hansen: I believe so; any characteristics that go to make up a plant can be transmitted; any combination of characters not conflicting or incompatible, if you make crosses enough.

Mr. Patten: That is, the size or perfection of the leaf as a whole so that it will resist any unfavorable conditions in the summer season?

Prof. Hansen: Yes, I think so, I think your own apple seedlings show that, as you select for perfect foliage, and for persistence in holding the fruit in trying seasons.

Mr. Patten: Do you think that can be done without crossing?

Prof. Hansen: It might be possible, I think, to get it without crossing, but we have to wait for nature to do the crossing or for a mutation to appear. Crossing introduces new elements of variation and hence hastens the work of evolution.

Mr. Patten: If you dispute the fact that form and size and color and everything of that kind be developed, can not be produced, you dispute the whole law of heredity and if you breed a thousand plants or one hundred plants and select from that hundred plants the most perfect leaf, the one that endures all the unfavorable conditions of the summer season, that is the plant certainly that will tend to make your plants hardy, will it not, it will tend to make it an enduring plant. The next feature then that you must add is breeding a plant that will ripen its leaf in the proper season, according to the latitude in which it is, and that also will tend to this property of hardiness, which is only a sort of an accommodative term expressing the general fact of the character of the plant,—this word hardiness. As I said, adaptation is the word, the word hardiness does not meet the question at all in my opinion.

Now, then, I want to call your attention to the Turner raspberry. The Turner raspberry has endured thirty-five and forty degrees below zero and come out in very good condition. There is no one of those eastern raspberries of the older varieties that have been on the market for years that will endure a temperature of more than twenty and survive so that you can get a crop from them at all. We have the Snyder blackberry, for instance, that is a comparatively hardy blackberry; I have never been able to select a blackberry from the forest in northern Iowa that would compare in hardiness with the Snyder blackberry, so that we see with these plants, so far as we are able to judge, that they have developed a degree of adaptation to the climate in which

they have appeared. The Turner raspberry appeared down here in central Illinois and we have developed nothing here unless it is the King raspberry and I believe that was up near St. Paul.

Prof. Hansen has not covered the ground, he has not answered the question with reference to this catalpa. This catalpa, so far as we know, inherited the hardiness of latitude of Virginia, it has been there for ages and ages past; and yet, under the hand of man, with the distribution here in a short time, without any effort on the part of man, as you might say, it has gone from three hundred to four hundred miles north and I have them on my own grounds, and I have demonstrated that by taking those seedlings that first came here from Indiana, and selecting seeds from those seedlings, that I have increased in one generation those plants nearly fifty per cent. in hardiness. Now, they had nothing but merely to become hardy, simply pure *Speciosa* seedlings and nothing else and Prof. Sandsten over here just turned around and called my attention to the fact of corn. Gentlemen, the fact is that we have not done anything yet that we may do. I thoroughly believe that we can treat corn in fifty years so that it will endure a temperature of six to eight degrees more than any corn that is known to-day, and I want to refer now to two instances where this matter has come under my observation with reference to corn. I happened to be out in Dakota a few years ago when we had a very severe frost on corn, that was about twelve to eighteen inches high, and there was more than an acre along the lower part of the field that was almost wholly killed by frost and there would be one spear each in a hill that would be exempt from frost, all the others would be dead and it was not an exception, there were dozens of them. Had I been an agriculturist or an experimenter on an agricultural farm, I would have examined one hundred thousand of those corn stalks,—there would be, for instance, two killed, one partially killed and another scarcely touched, and so it was over an acre of ground,—and I would have saved those that survived. I believe when we come down to work that we can breed a corn that will endure six to eight degrees at least more than any corn in existence and easily done, because we can repeat it every year by planting corn early enough to be killed by the frost.

Prof. Hansen: Last fall I saw experiments along this line in Lapland, north of the Arctic circle at the experiment station at Lulea, northern Sweden. They had two refrigerating houses, one for cooling, the other for freezing. Here I found barley which grows further north than any other cereal, grown in boxes of earth. These are taken in different stages of growth and frozen or frosted; then the seed is saved from the plants that

live through the severe test. This is the only place in the world where such work is being done with cereals. The only other work I can think of is at the Rhode Island experiment station where they are freezing up beans, I believe, and taking the seed from the plants that survive, if any survive. I am not saying that it cannot be done with corn; although they have not made any progress all over northern Europe in three centuries in adapting corn to a cold climate. It seems to demand a certain tropical heat for a short period. But it can get along with a shorter period of heat. Take the case of the crab, apple, cherry, grape and raspberry; we have not secured a hardy variety in several centuries from the original stock brought over from the mild, moist sea coast climate of western Europe.

As for hardiness, answering Mr. Patten's remark, hardiness is only one factor of adaptation. It may mean resistance to cold, that is the way we understand it chiefly here, but real hardiness means also the resistance to heat, drouth, fungus troubles and all that. We can get all that by crossing or by straight selection if we raise enough seedlings. We may obtain almost any combination. I believe that Mr. Patten has done some magnificent work with his apple seedlings. We cannot tell beforehand just what the combination is that will make "the Shakespeare of the species," as I have called it. That is the one plant we are after; Shakespeare appeared only once in the history of the human race and we are after his equal, figuratively speaking, in the apple line. We do not want any local author, we want the best. As far as the climate is concerned, Prof. Munson of Texas has learned by repeated trials that our selected northern wild plums winter kill in Texas,—they wake up too early. That is another feature of adaptation, they are too far north. In southern Russia the Siberian larch is a failure in the south because it starts too early. As far as the Turner raspberry is concerned, it stood fairly well in Dakota until the early '90s, then the dry seasons came on and out they went. The Turner went out with me at Brookings, it is worthless and tender. It may bear fruit once in a while when very carefully protected, but it is off the list. We have tested the Snyder blackberry, it also is an absolute failure. All the blackberries are failures. All eastern raspberries have failed, standing out on the open prairie away from the shelter of Minnesota woods. The only raspberry that is going to win out will be of pure native stock, or hybrids of the cultivated with the wild raspberries of the northwest. The surest, quickest and very likely the only way to get hardiness into a tender species, is to use a hardy species in crossing, because thousands and tens of thousands of years have done the

work which you cannot do in your lifetime. Don't start on a ten thousand year job in your work in acclimating tender plants.

Prof. Sandsten: I want to refer back to the corn incident. I think Prof. Hansen misunderstood me. I did not mean to say that corn was standing frost, but I thought I made myself understood by saying that corn can be matured with several degrees less heat now in the northern part of this state than it could fifty years ago. That is to say, if an ear of corn will ripen with a less degree of heat in northern Minnesota to-day than it could fifty years ago, it does not require as much heat as it did previously. I do not mean to say that it can stand the frost, I hardly hope to live to see a corn plant endure the frost. I also realize that Prof. Hansen has a different problem before him from what we have, it is not only the question of temperature, but it is a question of drought. We may have a temperature of forty below zero in Wisconsin and not kill some of our plants, while the same temperature would kill the same plants in South Dakota, because they have the droughty condition that we have not, and he has a problem to work out entirely different from ours and he may be right in his ideas of hardiness of obtaining it from the native stock. But we have also found this thing in our native crab apple which we call so hardy, that it is not any more hardy than many of our hardy apples taken to Texas; many of them die there.

Mr. Toole: This society never had such a waking up on the subject of plant-breeding and we have so many thoughts to carry home with us to help us along in planting for future work. But if we take everything for granted as proven, every theory that we have heard, we might be discouraged in the enthusiasm we have shown and with which we expect to carry on our development of a winter apple and a more hardy winter apple than we have. But we have great encouragement and so much has been given to us in what has been developed in the seedlings and what we find from getting the history of apples shown at this meeting, that I think we do not know really what latent hardiness is stored away in some kinds of apples that we have been breeding and I do not think we need to be the least bit discouraged in this part of the United States in going on and breeding through selection and crossing, without any hybridizing whatever.

Mr. M. S. Kellogg: I would like to ask in regard to the work of the trial orchard, from what class of trees have the scions been taken from which these trees have been grown? Have they been from any carefully selected scions, or have they been indiscriminately selected and indiscriminately grafted?

The Secretary: Mr. Kellogg can answer part of that, because some of the stock was taken from his nursery.

Mr. Kellogg: That is just the point. If we are going to attempt to confine ourselves to a selection of varieties and a selection of scions in this grafting, we have got to put the price of nursery stock up where you cannot touch it with a ten-foot pole. But if you are going to graft indiscriminately, you will have to take what the nurserymen have and sell to you at prices that they think are remunerative.

Prof. Sandsten: I think there is some truth and philosophy in that, yet I hardly think the price ought to be made so high that we cannot reach it with a bamboo pole. I think there is a reasonable limit to it, and I think if the nurseryman will sell his trees for thirty-five to forty cents apiece, he can afford to select his scions and not get the scions in the nursery. Not only that, but to have some one else cut them for him, who does not know one tree from another. We would hear less to-day against the nurserymen in this state if the cutting of scions were done more judiciously. I mean to say that so many trees are sold under the wrong name, and it is hurting nurserymen a great deal and it would be better if the nurserymen would charge thirty-five, even fifty cents a tree at retail and sell farmers trees true to name, they would be better off. I have letters almost every day from farmers saying: "What can we do, we never get a tree true to name?" Not always, but in most cases. That is a thing that nurserymen can remedy by being careful in cutting the scion and I believe that the nurseryman ought to have an orchard and cut his scions from bearing trees if possible. I am not advocating that strenuously, but I think they can get trees true to name.

Prof. Hansen: Just a word from the standpoint of European nurseries. We regulate the output and price and quality of the scion. Sometime when we get a little more sense and we have wasted a little more money, we will establish this fact, that the nursery business is a profession and men who go into it should be regulated and submit to regulations just the same as anybody else; that would enforce honest competition. Now, your whole fraternity is suffering from dishonest competition and you are the biggest set of chumps to submit to it. (Applause.)

THE SPENCER SEEDLESS APPLE.

A Member: I would like to ask information about the seedless apple.

Prof. Sandsten: Mr. President, I know a great deal about it and I know very little. I know some of the history of it and if Mr. Jewett is here from Sparta he might be able to tell us just as much as I can. The history of the seedless apple as I have it direct from Mr. Spencer, the man who has introduced the Spencer seedless apple, is something like this: I think it was in the 50s when a member of the Wisconsin militia brought the apple, or some scions or trees, from Virginia. It was planted in the western part of this state by Mr. Waters, and he grew a great many of them, several thousand grafts were put out and Mr. Waters never paid any attention to it. Mr. Waters, by the way, was associated with Mr. Jewett of Sparta. But the apple was practically lost, so when Mr. Waters moved to Colorado he took a few apples with him and he gave to his nephew, Mr. Spencer, some of these apples. After a period of time, Mr. Waters moved to White Salmon, Washington, where he is living to-day at the age of eighty-five years, and he took some plants with him to Washington and he grew some trees and there are trees now growing in Washington. I have had several letters from Mr. Waters and he sent me some of the scions of the trees growing in Washington, and he also sent me a box of the seedless apples grown in Washington. At the same time I received a box of apples grown in Colorado. Now, the apples were identical, there is no difference in them at all, and it was undoubtedly the same apple. It is not a wonderful invention by Mr. Spencer in handling the same, it is a plain fraud and Mr. Waters says he is not surprised at it that it should be that way. Evidently he can explain it no other way than by saying that Mr. Spencer probably thought that he was dead and buried and that no one knew of the seedless apple, but Mr. Waters came to life and lived to see the fraud. Now, the apple is selling all over the country and Prof. Fletcher told me that thousands are being sold in Michigan. Fruit growers and farmers paid two dollars apiece, some company is established in almost every state and in Canada, selling these trees at two dollars apiece and they are not worth two cents apiece. Now, it is right that the public should know the circumstances of this company and the value of the fruit. The apple is as poor as any Ben Davis,

it can be used for a baseball just like the Ben Davis can, and it is all right for keeping qualities, as no one will eat it. The tree is a fair grower. In our experience with them, our grafts grew two feet in one season, grew very vigorously, but the apple has no value and it is certainly not worth two dollars apiece; might be worth ten cents to us as a novelty, but the trees should not be bought.

The Secretary: I want to say a word to emphasize what Prof. Sandsten has said in regard to the seedless apple. I also had correspondence with Mr. Waters and I want to add one word to that. I received samples of the Waters' Seedless and samples of the Spencer Seedless, and I pronounce them identical, it is the same apple beyond a doubt, and if you recall one of the claims made by the Spencer Seedless apple companies, it is this, that the apple was codling moth proof and that the worms did not attack it. Out of the eight apples that I received from Mr. Waters five were wormy, and out of the five which I received from the Spencer Seedless orchard, three were wormy and that is a pretty fair proportion, assuming those from the Spencer Seedless orchard represented the average quality. I photographed those at long and short range, upside down and inside out and I have pictures of all of them.

Prof. Sandsten: The worms have very poor taste when they go into a Spencer Seedless apple.

Mr. Jewett: I wish to say that the professor has given the exact facts in the matter of the Spencer apple.

Mr. Patten: I wish to say that I suppose Prof. Sandsten meant no reflection on the Ben Davis apple when he referred to it as a baseball apple. He, I presume, intended to say a Wisconsin grown Ben Davis.

The Secretary: I want to ask the people here if any one knows of a Spencer Seedless apple company in Wisconsin. I understand that a branch of the company has been established in this state. Is there a branch company in Wisconsin, does any one know of any company selling the Spencer Seedless apple in Wisconsin? If so, I would like to know about it and I think Prof. Sandsten would like to know about it also; if the agents are at work, I am sure I would be glad to be informed at any time, and I think the horticultural department of the university would also.

Mr. Rosenow: I got the information from a salesman that it had been around our way and is working Oshkosh county and he is distributing circulars and making large claims for the Spencer apple. Just a few weeks ago he was around that way.

Mr. Melcher: I met probably the same agent as Mr. Ros-

enow. I might say, he is advertising them in the local papers and I think he is doing considerable business.

Prof. Hansen: The Seedless apple is an interesting topic. It is a very old thing, hundreds of years old. These Seedless apples bob up in every generation; there is not one of the lot that is of any account. I was talking with the United States pomologist last December and he thinks it is simply a renaming of the same old varieties that have appeared heretofore. It is a fraud, the best you can say for it, and I hope it can be stopped before it goes further.

A PLANT BREEDER'S TRIP THROUGH SIBERIA AND AROUND THE WORLD.

By PROF. N. E. HANSON, South Dakota State College of Agriculture and Mechanic Arts, Brookings, South Dakota.

The principal object of my third trip to Russia, from which I returned January 2nd of the present year, was to trace the northern limits of alfalfa in Asia. The journey began June 23, 1906, and the six months' journey turned out to be a trip around the world, ranging in latitude from 70 to 20 degrees.

One of the objects of Hon. James Wilson, Secretary of Agriculture, in his work in agricultural exploration, is to conquer "the Great American Desert" by the introduction of economic plants from similar climates of the old world. In 1897-98, as part of this work, I made an overland journey of 2,000 miles through Turkestan, western China and southern Siberia; as one result of this adventuresome effort, Turkestan alfalfa was imported to America for the first time and its northern limits traced in the overland journey. On this second trip to Siberia, I took up the broken trail where I left it and followed where it led which proved to be clear across the continent of Asia. The interesting fact was brought out that where the blue flowered alfalfa stops, the yellow flowered species are found extending from 1,000 to 2,000 miles further north across the continent. As they are excellent forage plants in dry sections, it seems to indicate that the alfalfa belt will be ultimately extended in North America as far north as we may care to farm. Not an ounce of the seed is for sale anywhere; all the seed was

gathered from wild plants on the Siberian steppes. Some tap-rooted Siberian clovers were found in this same region, also other promising forage plants.

It was a great privilege to attend the International Conference of Hybridizing and Cross-Breeding in London, and some remarkable advances have been recorded since the last International Conference four years ago, which I also had the honor of attending. Some three years before this time, the present series of Conferences of Plant Breeders was begun in London by the Royal Horticultural Society. In about four years from now the next Horticultural Conference will probably be held in Paris. At the New York Conference, Dr. Bateson of Cambridge University, came from England to tell us about Mendel's Law of Heredity, recently re-discovered. Since that time the work of demonstrating the applicability of this law has been going on vigorously in many parts of Europe, with Cambridge University in the lead.

Briefly it may be stated that in the crossing of two distinct varieties of plants, say A and B, the opposing characteristics are either dominant or recessive and arrange themselves by chance in equal numbers of AA's and BB's, say 25 of each in each 100, with 50 AB's. The AA's may be called dominant, the BB's recessive, and the AB's heterozygote. AA's or BB's are fixed in type at once; the AB's can never be fixed because they split up again in the next generation. All are apparently alike in the first generation, but the unknown character of each can be demonstrated only by testing their reproductive power. This shows at once which are true to type and which are not; in other words, the type is fixed at once without going through a long process covering many years of laborious selection. It appears the law applies to animals also, and animal and plant breeding in Europe and America will henceforth be put upon more of a scientific basis by this new law. In the exhibit from Cambridge University and elsewhere was shown a remarkable series of specimens showing the applicability of this law in the breeding of plants and animals, such as sweet peas, stocks, garden peas, corn, wheat, mice, sheep, horses, moths, snails, and so forth. Furthermore, the law applies to intangible things like disease-resistance in plants and to milling quality and high yield in wheat. It appears probable that the animal and plant breeding of the world will be greatly modified as to methods by the application of this law of heredity.

The problem of the English wheat breeder has been to combine the high milling qualities of the American wheats with the high yield of the English wheats. The American wheats, with

their superior and strong milling qualities, are not liked by farmers in England because of their low yield in the English climate. The attempt is being made, however, to originate varieties which combine the superior milling qualities of the American wheats with the high-yielding power of the English wheats, and with excellent prospects of success.

In two years these new varieties will be ready for distribution. The work is being done at Cambridge University in England. In a visit to Cambridge University, I noticed some interesting work being done in the cross-breeding of sheep, showing that Mendel's Law holds good for sheep as well as sweet peas, also in the breeding of poultry. The problem, however, becomes quite complicated at times because some qualities are inherited in pairs ("genetic coupling") or even higher numbers, so that large numbers are necessary to make clear the law.

Dr. Bateson, in his address as president of the Conference, named this new science "Genetics," which is a shorter word than Artificial Evolution and Thrommatology which had been employed hitherto. Dr. Tschermack of Austria also enriched the science with the new work "Kryptomer" by which is meant the hidden quality transmitted in a dormant state to the next generation.

The Royal Horticultural Society offered royal hospitality to all foreign delegates throughout the meeting. The seat of honor at the great banquet was given to your delegate from the United States. The English nobility was represented in goodly numbers at the banquet, and garden parties or lunches were also given by Sir Lawrence, president of the society, Baron Rothschild, and the London Horticultural Society.

In my paper on Breeding Cold-Resistant Fruits, I tried to illustrate the point that it is possible to transmit resistance to cold by hybridizing hardy with tender species of plants, and told of the work in this line in South Dakota.

A large number of other extremely valuable papers were read at the Conference, but lack of time at present prevents any fuller details.

There has been a big boom in England in the way of disease-resistant potatoes and prices went to a fabulous height. This question was discussed at the Conference and I afterwards investigated the question elsewhere in England. The boom collapsed a few months ago, and the much boomed varieties, "Northern Star" and "El Dorado," fell from their high pedestals when put to actual field trial. However, substantial and accurate work is being done in developing the disease-resistant varieties of the potato, and full success is only a question of

time. The work henceforth will be done upon a rock bottom foundation and no more balloon voyages will be possible for the British public. The dream of the potato-breeder is to originate a variety proof against the blight which caused the potato famine in Ireland some sixty years ago. The man who succeeds first will be indeed a benefactor to the race. Other species of potatoes are being imported from various regions of the world and many crosses are being attempted.

After leaving England, the experiment station work of Denmark, Norway and Sweden was studied, including the far northern part of Norway and Sweden called Lapland, north of the Arctic Circle. At Lulea, Northern Sweden, some remarkable work was being done in originating varieties of cereals, especially barley, capable of enduring frosts at critical stages of growth. At Svalof, southern Sweden, I found that the principle of mutation had been recognized in the course of extensive experiments in originating new varieties of cereals. The many excellent varieties already obtained, we may now consider according to De Vries to be elementary species, isolated from systematic species. The varieties obtained are remarkable for uniformity of type. At all of the experiment stations visited, De Vries' mutation theory was recognized as being of primary importance in plant-breeding and animal breeders must recognize its equal importance in their work. The journey was continued through Finland, European Russia and Siberia, the homeward journey being via Japan.

In Russia in 1894 I remember visiting the estate of a prince who owned 210,000 acres of land. On this estate there was a potato patch of 1,000 acres which were used for the manufacture of alcohol. At that time we could make no use of such varieties but with the free alcohol bill, a wide field is now open. In Russia certain varieties of potatoes have been found to be high in starch content, too coarse for table use, very productive, and found especially suitable for the manufacture of alcohol. They are also used in stock feeding. Seventeen barrels or casks of these varieties were obtained for trial.

In visiting Russian nurseries I found that the question of root-killing of the apple has become more than ever an oppressing problem. Some of the Russian nurserymen have been slow to adopt the Siberian crab (*Pyrus baccata*) as a stock for the apple, because the seed was not readily obtainable, and they could get the French crab seed from France very cheaply. By French crab is meant the same species as the cultivated apple (*Pyrus Malus*). Recent severe winters however have caused such extensive losses that these nurserymen have come to the

conclusion that Siberian roots were necessary. *Pyrus baccata* is the pure Siberian crab; the old Yellow Siberian is a large fruited variety of this species. *Pyrus prunifolia* is also a North Asiatic species and is considered by some American authorities to be a hybrid of the *Pyrus baccata* with *Pyrus Malus*. In the cultivation they are represented by such hybrid crabs as Transcendent, Minnesota, Hyslop, Whitney, Virginia, Early Strawberry and Florence. I presented this theory as to the hybrid origin of *Pyrus prunifolia* to many while abroad but the general opinion was that it was a pure species and not a hybrid. Some favored using *Pyrus prunifolia* because its budding season was longer than that of *Pyrus baccata*. As to relative hardiness, *Pyrus baccata* is no doubt hardier than *Pyrus prunifolia* as it ranges further north. But for a large area of our prairie Northwest both species will probably be hardy enough.

In the course of the journey many other seeds and plants of agricultural and horticultural interest were obtained. But this paper is long enough now.

The trip was a rough, adventuresome one, with political and social conditions very unsettled. Personally, I have always found the Russians a hospitable, courteous people, who have a great regard and friendship for America and Americans. The trip was not an easy task, but I found the plants whose existence I suspected nine years ago, and it is a great satisfaction to feel that in all probability it will advance northwestern prairie agriculture, and especially in the newer regions of the western Dakotas.

Some of the plants may help Wisconsin and wherever trouble has been experienced with winter-killing of the common alfalfa. It is worthy of note that many of the failures in farming in the semi-arid regions of the west are due to the fact that the plants cultivated were from Western Europe; in other words, it is unwise to farm in a dry climate with wet climate plants. In like manner we may say that it appears to be an undertaking fraught with disappointment to attempt to acclimate an alfalfa originally from Northern Africa to the cool moist climate of Wisconsin. Some of our efforts at acclimating plants really means that we are undertaking a job that nature has taken some thousands of years to accomplish.

STRAWBERRY REVIEW.

M. S. KELLOGG, Janesville.

" 'Tis hard to say, if greater want of skill
Appear in writing, or in judging ill;
But, of the two, less dangerous is the offense
To tire our patience, than mislead our sense."

Mr. President, Ladies and Gentlemen: If in the few minutes that shall be taken at this time to listen to a short review of the past season, and one of the virtues of this review will be its length, I shall perhaps trespass on your good nature to repeat that which has been said so many times before in the meetings of this honored Society and of others but if I "tire your patience," I will endeavor not to "mislead your sense." If that which is said shall be a repetition of oft told truths, bear with me, and remember that perhaps there is a "doubting Thomas" here who has not heard, or having heard did not understand the successful methods of Strawberry culture.

Plant injury 1905-6 and cause. There is in the writer's estimation but three causes that entered into the so-called winter-killing of Strawberry plants, during the winter in question. First is a failure to properly cover the plants; second a lack of moisture to be found in the soil at the time the ground freezes up for winter (and this had very little to do with injury during this winter as the rain fall was quite plentiful the fall of 1905); third, the long continued spell of soft weather, lasting from about February 20th until April; during these several weeks only rarely did the ground remain frozen for two nights consecutively without the frost coming out during the day to the depth of several inches. This long continued and extreme changing of temperature sapped the vitality from the plants to a greater extent than any winter since 1898-9, when the destruction of fruit trees, plants and vines was so wide spread. Strawberry plants came out in April, 1906, with no green leaves whatever, all growth having come up from the buds, weakened by the causes already given. Another governing cause for the injury will be found in the fact that the summer of 1905 was very dry and that plants did not make the usual growth, or have the usual vigor and length of root, so they were more easily heaved out of the ground during the trying weather of February and March, 1906. In the southern part of the state, we

are only twelve miles from the Illinois state line, plants went into winter quarters in fairly good shape. Without question some of the cases where injury was shown was by lack of proper covering, or at least lack of proper attention to see that the covering remained where it was applied. The only way in which we were able to determine if our plants were injured last spring was in the number that failed to grow in our new plantings; this was about 5 per cent., somewhat larger per cent. than usual, and from reports we received from our customers and others we must conclude that the loss of plants last spring was greater than for several years. We had no fruiting beds left from our plantings in 1905 as we dug all the beds out to supply our plant trade.

1906 crop and prices. The crop with us was about three-quarters of a full crop. Berries began ripening about the first of June, marketing began on the 12th; the season reached its height on June 23rd and closed on July 7th. The quality of the fruit was from fair to good, and prices ranged firm and good. Season opened with price at 12½ cents, and reached the lowest point at the height of the season, at which time good berries were bringing 8 cents per quart at wholesale. Taken altogether the prices were very satisfactory, and taken with the fairly good yield, growers fared pretty well in our section.

Most profitable varieties. This much mooted question will no doubt provoke lively discussion, and the writer would have accepted the subject assigned to him with fear and trembling had he known that this was to be the only paper on Strawberries during this meeting. The five most profitable varieties with us, would be as follows:

Senator Dunlap, which easily heads the list, Clyde, Bederwood, Warfield and Lovett.

In connection with this list of five varieties it must be remembered that our soil is black prairie loam, and lays pretty level, yet has sufficient drainage so that surface water seldom stands on the land. The list would without doubt be varied on the different soils and perhaps with different culture. We plant our Strawberries four feet by two and mark the field after the same has been well prepared by fall plowing, followed by spring plowing and harrowed to a fine tilth. The marking is done with a light wood marker, similar to the old fashioned corn marker, drawn by two men and guided by a third. The cross marks are made with a similar marker with the teeth two feet apart and then plants are set where the marks cross. Care is taken that the crowns are not too deep nor too high and the field is cultivated at once. We use a spade to open holes in setting, having found it the most satisfactory tool for that purpose. Re-

member three things are necessary in strawberry growing, these are cultivate early and often, then cultivate again, and finally during the hot, dry summer months cultivate all the time. Where plants are rowed both ways it does away with a large part of the hand work and reduces the cost of caring for an acre up to the time of fruiting. When the runners get 8 inches long it is time to stop cross cultivation and begin to prepare your bed for fruiting by laying down the runners. The early plants make the strongest fruiting vines, and it is to your advantage to have as many early ones as possible. We practice, as nearly all plant growers do, the matted row system, and have found that this system answers all needs where the two objects are fruit and plants.

The past season we had no new beds to fruit as we dug out all of our 1905 plantings for the plants, so these observations have been from old beds fruiting the second and third time.

DISCUSSION.

Mr. Daub: Mr. Kellogg made a statement that he thought it was frost and winter kill that caused the injury and also lack of covering. Now mine were thoroughly covered; I had about three tons of straw to the acre and they froze out or died, I don't know which. There was no lack of cover on my part. I live in Eau Claire, in the northern part of Wisconsin. We have plenty of moisture, plenty of snow, they were never exposed all winter until the spring thaws, and the spring thaws were not very injurious to our plants. And I noticed at the same time in some of our places where men had not covered their plants at all, on side hills where they were wind swept and yet they lived and were thrifty. Those were a few exceptions. Now if they were winter killed, it looks to my mind as if those were the ones that ought to have suffered. I am speaking particularly of one piece that was exposed at the north-west where we get the severe wind, the snow had been almost entirely removed by the wind and that was one of the few pieces that existed in the spring and yielded a big crop and some of the covered fields failed to a great extent.

Mr. Turner: Might it not have been to much mulching and a large amount of snow that must have smothered the plants in Northern Wisconsin?

Mr. Richardson: I do not think it was, because we have had sections of our land that were covered with snow that thawed

and they were frozen in in the ice and those would come out in better condition than some with covers, so I do not think it was smothering.

Mr. Toole: Our strawberry plants in Sauk county suffered badly with winter killing and the clover also and we think it was with too much covering and that was with ice. We could see with our clover and alfalfa wherever the ice under the snow had been anchored, there they suffered the most. Mr. Pearson is here and he can tell about the conditions that he suffered very badly with last winter.

Mr. Kellogg: Do I understand Mr. Richardson to say that their plants on which the water was standing so that the ice formed above the plants came through in good condition?

Mr. Richardson: Yes, we have had a section of our field which froze solid.

Mr. Kellogg: Please tell us what kind those were.

Mr. Richardson: Warfield and Senator Dunlap.

Mr. Turner: In every instance where the ice covered the strawberry plants in my field, they died.

Mr. Pearson: I am not very anxious to discuss this question as it is not a very pleasant subject. I found considerable injury in the spring and found that I had to cancel several hundred dollars worth of orders for strawberry plants. It is not a pleasant subject to contemplate, and I have tried to find out what the cause of the injury was, but I have about concluded that it was ice, because where there was deep snow after a rain, where the snow had blown into the ravines and held the ice off the plants, they were not injured; where the ground was bare when that rain came and the ice froze onto the plants, they were packed very closely in the dirt and the leaves seemed to be dead in the spring and I concluded from that that it was the ice that killed the plants.

Mr. Post: In regard to the ice subject, if water forms over the strawberry bed and the water is sufficiently cold to freeze that ice solid down to the ground and the frost remaining in the ground, it will invariably kill the plants, but with a sufficient quantity of water under the ice, the strawberries will live. That has been our experience for twenty years.

Mr. Daub: I can corroborate the statement of the gentleman, I believe he is right.

Mr. Hutchins: I am not a strawberry man, but I am very much like the man Mark Twain tells about who never had any children of his own and who had given the subject a half hour's consideration and felt qualified to give impartial advice to parents. That is somewhat the case with me in regard to straw-

berries, however, I find from the discussion which I find quite animated in different places, that it is agreed among strawberry men that it is partly due to what is termed "root rot." I have heard in different places of this disease of plants. The President of the Michigan Horticultural Society, Mr. Cook of Owosso, is quite a large strawberry grower and of late he has had a great deal of difficulty with this injury and Professor Taft of the Horticultural College of Michigan has dealt with it and while so far as I am aware they have not traced the difficulty, that is, they have not located it, have not diagnosed it completely, still they are inclined to attribute it to the root rot. It is quite possible that you have the same difficulty here.

Mr. Smith: We have been raising strawberries for a good many years and lost one half or more of our plants last spring. I think in every case where the winter rains came and melted the snow, as was the case a year ago, after nearly every snow we had a rain which melted most of the snow and then it froze and wherever this ice formed over the plants, as has been stated, the plants were dead and I have never known it to fail, in all the years we have worked, to kill strawberry plants if water gathers in the winter over the plants and freezes down to the ground. I was foolish enough to follow the advice of people who advocate unqualifiedly setting the rows the long way of the ground. It is a great deal easier cultivating and a great deal easier picking, because you will not have any after such a winter as last year. We lost one half of our crop practically as a result of having the rows set lengthwise of the bed. In cultivating, the cultivator will of necessity (and it is impossible to avoid it, I think) make slight ridges, perhaps not over an inch high or two inches high at the sides; I speak of level land now, not rolling land. Our land is level. The ground on the sides is a little higher than the middle and with the rows set lengthwise the water cannot get off, where we have those winter rains. The result was that it lodged in many places, not from improper drainage, but simply from the result of the cultivation, held the water back, flooded in spots all over the field, and the result is destruction. Whereas, if the rows had been crosswise, the water would have followed down those little furrows and gone into the ditches.

Mr. Hager: I want to put in a word here in regard to my experience and what I saw in my immediate vicinity. I saw small beds where the water had stood and had frozen up solid and stayed so all winter and the plants were in good shape. I saw beds well mulched on rolling land, light, porous soil in which they killed absolutely and I want to say in regard to my own beds, some of the plants outside of the mulching. We put

our rows four feet apart, having a matted row of about sixteen to eighteen inches. We aim to cover or mulch the matted row but in some instances they were not all covered and there were a few plants sticking out of the mulch and in some instances those sticking out were alive and those under the straw were absolutely dead and I have come to the conclusion that there was more than one thing the matter, that it was a combination of circumstances, because I cannot explain the various conditions with any one thing, and I am inclined to think that it was a disease as much as it was climatic conditions, for the reason that when we came to dig plants we found so many of the plants that were apparently alive, with a green top, but the roots were black, or partly blackened, and I am of the opinion that it was more than climatic conditions.

Mr. Kellogg: There is no doubt quite a difference between conditions that exist in our locality in the southern part of the state and those toward the northern part of the state. The gentleman stated that the leaves showed green in the spring and the roots were dead. With us the leaves were all dead when we uncovered them, they were all simply left in the bed and our loss has been somewhat in excess of the average. It was done gradually, so that it leads us to think that what injury we suffered was by the soft weather in February and March, alternating with frost. They were pulled up by the roots and they stood looking like a spider trying to find some place to go.

Mr. Crawford: I remember having a patch some years ago that was under water for perhaps a week at a time, the children skating over it and then the thaw came one day; it was under water again the same winter, frozen again with the skating rink the second time, and when spring came the plants were just as healthy as could be.

Mr. Van Loon: We had an experience last winter different from any proposition that we ever undertook in the line of raising strawberries. We were fortunate enough to have the largest part of our beds planted to the Senator Dunlap strawberries; a few rows, perhaps three or four of them, were of the Bederwood and the Warfield. The plants of the Dunlaps, owing to the rich quality of the soil and the manures that had been applied, showed a very rank growth, the beds being so thickly set with plants that we could not expect to get fruit in the shape that they were in. On account of scarcity of help we concluded that it was necessary to do something different from hoeing and cutting these out, so in reading over a book that was published by Mr. Perry of Ohio, we found that in the Southern Wisconsin, I think, is a man by the name of Smith, living in

Green Bay at that time whom Mr. Perry visited during the same season; he found that Mr. Smith had a great share of his crop of strawberries entirely covered with mulch, not only between the rows as has been stated and as is the usual custom, but all of the plants entirely covered and thickly covered. From the way that these plants survived and looked in the spring of the year, we concluded that it might perhaps add to the vitality of some of these new varieties, for instance, the Dunlap, they showed a great deal stronger growth after this treatment. We went to work and followed the directions that Mr. Perry gave in his book, first covering with pea straw, partially, while the other part is covered with hay and straw such as we have, wheat or rye straw. In addition to this, we covered the entire surface with barnyard manure, so that every plant that was growing on that soil was out of sight and remained out of sight. This was done for the purpose of smothering, to a large extent, this part of the bed where the ground had become so thickly set with plants. The result of it was that late in the spring a few of these plants began to show, not many, but in digging under and in handling the plants under the mulch we found a great number of the plants were alive, perhaps even more than we wanted and further on the berries in consequence of this were much later in ripening, but we found that with the work that we had done and the manure that we had applied that that was one way of growing plants in a bed where the plants are so thickly set and where you do not want to put in any work. While it does not affect the plants to the extent of killing them outright, with the exception of some of these plants that were planted next to the Dunlaps, the Bederwood and the Warfield, a good share of them had actually killed out in large patches, while right along the row of the Dunlaps were plants sufficient to produce a crop such as we had never raised before. That was in the winter of 1905-6.

WEDNESDAY AFTERNOON SESSION.

THE COST OF PRODUCTION IN FRUIT GROWING.

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The rapid development of commercial fruit growing is one of the most notable features of American agriculture. Previous to 1860 there were very few commercial orchards, fruits were

grown almost wholly for home use, and not for market. With the growth of cities, and the corresponding increase in the demand for large quantities of fresh fruit, some men found it profitable to abandon general farming and to give more attention to the orchards and small fruit garden, which had hitherto been greatly neglected. From these small beginnings of about fifty years ago the great fruit interests of the present time have developed, and especially during the past twenty-five years.

The 12th census reports that on 1.4 per cent. or 86,094 of the 6,149,584 farms in the United States fruit growing is the leading industry. These farms included 6,064,877 acres of fruit plants which produced, in 1899, 212,366,646 bushels of fruits, worth \$83,751,840. In value of the product fruit growing was eighth, the crop of corn being worth \$828,000,000; hay and forage, \$484,000,000; wheat, \$369,000,000; cotton, \$323,000,000; oats, \$217,000,000; vegetables, \$113,000,000; forest products, \$109,000,000; potatoes, \$98,000,000; fruit, \$83,000,000. According to the same report, there were \$404,000,000 invested in fruit farms, as compared with \$5,493,000,000 invested in hay and grain farms and \$5,691,000,000 in the live stock industry.

These figures reflect the rapidly increasing commercial importance of the fruit industry, but it must be remembered that they are the conditions existing during the last census year, 1899. Unquestionably the next census will show that 25 per cent. and more has been added to the amount of capital invested in fruit growing, and that fruit precedes potatoes and forest products, at least, in commercial importance. I wish to emphasize the point that the fruit growing business is expanding more rapidly than most other lines of crop husbandry. There is every probability that this expansion will continue, for fruit is becoming more generally considered a staple article of diet, and not a luxury, as formerly.

The rapidly increasing production of fruit has set in motion certain economic forces which the fruit growers of today may well consider. As the area in fruit becomes larger, competition becomes stronger and the prices received for fruit are correspondingly lower. The larger demand for fruit, due to the increase in population and the more common use of fruit as a staple article of diet, have not, in most cases, fully offset the increasing competition. In general, the prices received for fruit are lower now than they were fifteen years ago; that they will go lower still we have no doubt. There are many exceptions to this general rule, for the prices received for fruit depend upon economic conditions which are ever fluctuating, but, taken as a

whole, the prices that the fruit grower receives for his products are lower now than they used to be and probably they will continue to go lower.

To illustrate the fact that prices received for fruit are tending lower because of increasing competition, and also that this general tendency is continually upset somewhat by fluctuations in the relation between the supply and the demand for fruit, I quote the following market reports on Baldwin apple, Bartlett pear, Concord grape and Fancy quince. These quotations were taken from the files of the Rural New Yorker from 1880 to 1905 and are for the general market of New York City. The market quotations taken were for the week nearest the middle of each month. The price given for the year was secured by averaging the prices quoted for the several months. In all cases the quotations are for fancy fruit. In a few months no quotations were given; and when there was any doubt about the quantity or quality of fruit mentioned, it was not included. While this method of getting at the average price received for fruit in different years is open to criticism, it is, perhaps, as fair a comparison as can be made.

The quotations show that the price for Concord grapes and Bartlett pears have declined most noticeably, that the price received for quinces have declined but little, and that the price received for Baldwin apples have fluctuated least of all. The average price received for Baldwin apples from 1880 to 1895 was \$2.77 as compared with \$2.80, the average from 1895 to 1905; for Bartlett pears, \$6.56 as compared with \$4.04; for Concord grapes, 4c as compared with 2½c; for fancy quinces, \$4.61 as compared with \$3.78.

Although the prices received for fruit fluctuate widely from year to year, owing to many varying factors in the supply of fruit and the demand for it, yet there is a general tendency toward lower prices, just as there is in every other commodity the supply of which has increased very rapidly.

The fruit grower of today need not view this descending scale of prices with alarm. Reduced prices have been met, and probably will continue to be met for some time to come, by a lower cost of production, so that the profits may still be as large as in earlier years, though the prices received are smaller. But it is evident that the fruit grower must look forward to the time—if, indeed, it is not already here in some sections—when fruit growing will be profitable only to the man who can put superior fruit on the market at a very low cost of production. This means congenial climate, favorable soil, varieties that are perfectly adapted to the climatic and soil conditions and to the

demands of the market, and skill in all the details of culture and marketing. The owners of New England cotton mills are being forced to move them to the south, where the raw material and labor are cheaper, so that they can manufacture cotton goods at less expense. In every trade and industry the man who can produce the goods a trifle cheaper than his competitors has a tremendous advantage over them. So it is in fruit growing.

There are, of course, other things to be considered besides the ability to produce fruit cheaply, nearness to a good market, for example, may be worth more to the grower than a low cost of production. But it is undeniable that there is increasing necessity for the fruit grower to figure on the cost of production as accurately as he can, and to reduce it to the lowest point consistent with market returns. It is not possible for him to estimate the cost of producing his articles with anything like the accuracy of the manufacturer. The raw materials of the fruit grower are sunlight, air, water, soil; these are manufactured into fruit, but under such varying conditions that it is impossible to assign values and predict results accurately. But a fairly reliable estimate can be made, and I urge the necessity for such a calculation in view of the increasing competition in the fruit business.

COST OF LAND.

The main items which enter into the cost of production in fruit growing are land, capital, goods and labor. When the fruit grower buys land, he is really buying its fertility, or its power to produce crops. He is buying nitrogen, potash and other plant foods, soil, water, soil texture, the heat and light shed upon that soil by the sun. He is buying, not mere dirt, but all the energies and forces above the soil, as well as in it, that are needed to transform or manufacture plant food into apples, peaches, strawberries. The value of different soils as fruit factors varies greatly; the fruit grower learns that this often depends fully as much upon their texture as upon their chemical composition. He learns, moreover, that while man can do much to improve poor soils, and so increase their productivity—by tillage, green-manuring, irrigation, etc.—yet Nature does more to provide a soil with desirable qualities than man can ever do. It is for his interest to get land that already has a large productive capacity, if it can be procured. The need of under drains, for instance, may increase the cost of producing fruit several cents a bushel. There is much fruit planted on land that is so poor or so poorly drained that it has not the power to produce fruit economically.

The amount of capital that the fruit grower invests in land is large. The average size of the fruit farms of the United States is 74.8 acres as against 159.3 acres for hay and grain farms and 226.9 acres for live stock farms. But the average fruit farm is worth \$71.55 per acre, while the average hay and grain farm is worth \$30.34 per acre and the average stock farm, but \$21.14 per acre, so that the value of the average fruit farm is \$5,374, the hay and grain farm \$4,834 and the stock farm \$4,797. The census shows that 72.4 of the value of the average fruit farm is land, and this constitutes 72.3 of the value of the hay and grain farm, and 59.9 of the value of the stock farm. So it appears that the fruit grower usually has as large an investment in land as other husbandmen, and larger than many. The more perishable the fruits he grows the more imperative is it that land be secured near his market. This usually means that the land will be worth more and so the cost of production be increased that much. But the advantages of being close to a market may, and usually do, more than offset this loss, in the case of perishable fruits like strawberries, raspberries and plums. On the other hand, if the fruit can be grown just as well at a distance from the market, and is not quickly perishable, as winter pears or apples, it is manifestly a saving in cost of production. This, likewise, may be more than offset by the increased cost of getting the fruit to market. In figuring the cost of production the capital invested in land should be charged due interest.

COST OF CAPITAL GOODS.

Under this general heading are included such items as machinery, implements, buildings, farm animals, fertilizer, spraying materials, cash capital, and other things that are needed in growing and handling the crop. Here again the fruit grower has a heavy investment.

A machine or implement that does work formerly performed by hand, and does it cheaper, lowers the cost of production. Some machines and tools do better work than others; one spraying outfit may spray a tree just as well as another and a fraction of a cent cheaper. The fruit grower who uses the most improved cultivators, sprayers, pruning tools, so that the work is done cheapest, produces his fruit for the least money and, to that extent, has an advantage over his neighbor who uses tools poorly adapted for the work. High priced tools are not expensive if they do the work easier and cheaper. One should not begrudge the price of a new tool, if it will do the work in less time or with greater thoroughness.

The fruit grower is a specialist in agriculture; hence he requires more tools than the general farmer. The value of the implements and machinery on the average farm of 74 acres, is \$175, or \$2.34 per acre; on the average hay and grain farm of 159 acres \$166, or \$1.04 per acre; on the average live stock farm of 227 acres, \$151, or \$.66 per acre. The amount of capital invested in implements on all American farms is \$760,000,000, or an average of \$.90 per acre, which is an increase of nearly 80 per cent. since 1850; thus the fruit farm has 2½ times as much capital invested in implements as the average farm.

The point of view of the fruit grower regarding the amount of capital that he can afford to invest in implements should be this: he cannot afford not to have an implement that will enable him to produce fruit cheaper. The investigations of the Labor Bureau have led to the conclusion that in the last 20 years, by the aid of machinery and the substitution of horse, steam and other power for hand labor, the effectiveness of human labor on farms has been increased one-third. The cost of producing a bushel of choice fruit is certainly lower than it was 15 years ago. Has the fruit grower estimated how much the use of a power sprayer decreases the cost of protecting fruits from pests, as compared with a hand sprayer? He is perhaps not as dependent upon implements as the grain and hay farmer, but he should be watchful for every new labor-saving device that will cheapen the cost of raising fruit.

The amount of capital invested in buildings, machinery and livestock on the average fruit farm is 27.6 per cent. of the total investment, as compared with 27.7 per cent. on hay and grain farms and 40.1 per cent. on stock farms. The investment in fertilizers is usually much higher, being at the rate of 30 cents per acre for all the fruit farms of the country, while hay and grain farms invest four cents per acre and stock farms but two cents. There is, of course, much variation on this point. Most of the fertilizing for fruit is done east of the Mississippi; a very large proportion of the western fruit farms have never been fertilized. In addition to these items of required capital a certain amount of cash must be kept on hand to run the farm. This usually varies from \$4 to \$30 or more per acre according to the valuation of the land and the intensity of culture.

COST OF LABOR.

The labor problem enters into the fruit grower's budget of expense quite heavily, especially if he grows small fruits. Ac-

According to the twelfth census there is but one hired farm hand to every three farms. This shows that most of the work on the average farm is done by the farmer and his family. On the fruit farm hired labor is often necessary, especially at certain seasons, and most especially at harvesting. Although the average fruit farm is only one-half as large as the average hay and grain farm, it requires more labor, largely because it is cultivated more intensely. One of the increasing difficulties in fruit growing, as in other lines of farming, is to get sufficient reliable help. The man who grows perishable fruits is most concerned about this phase of the business. Some fruit growers meet the situation very satisfactorily by raising large families, but this solution is denied to some.

The man who is locating a fruit industry should consider very carefully where he can get labor and what it will cost. There is much difference in localities in this respect. In general, the nearer to a city or town the fruit farm is located the more easily the labor problem is solved. This advantage may help to offset higher valuation of land. Human labor is the most expensive item that enters into the cost of producing a bushel of fruit. The effort should be made to reduce the amount of hand labor that is needed by using improved machinery and tools. In some cases it is desirable to grow other crops besides fruit, so that the labor needed for fruit may be kept employed throughout the year, as is discussed further on.

FRUIT ZONES.

Besides these three primary factors in the cost of producing fruit—land, capital goods and labor—several other points bear a very important relation to the problem. The adaptability of the fruit or variety to the location, the site and the soil in which it is grown, has more influence than all the other points that have been mentioned. The fruit grower must remember, first of all, that there are fruit zones, or regions that are particularly adapted, by climate, topography and soil, for the culture of a certain fruit. Thus we have the grape belt of Chautauqua County, New York; the peach belt of western Michigan; the apple region of the Hood River Valley, Oregon; and so on. The limits of these general fruit zones are now pretty clearly defined, although every year small areas formerly considered uncongenial for a certain fruit are being found favorable for it. In most every locality a number of fruits can be grown; but the fruits that can be grown the best, and therefore the cheapest, may be but one or two kinds. Fruit growing is

bound to become more and more segregated, for increasing competition will make it impracticable to grow a staple fruit except in the locality and on the soil where it thrives best, and so can be grown cheapest. The demands of a near-by market, however, will offset this to some extent. In locating a fruit farm this point should be kept in mind, although market conditions, cost of land and other factors may sometimes make it expedient to grow a fruit outside its most congenial clime.

What is true of fruits as a whole is true also of varieties. Certain varieties thrive best in certain localities or on certain soils. It costs less to raise a bushel of fruit if the variety is happy in its environment than if it is not. This one point may have more to do with the cost of production than all others. The man who tries to raise Baldwins in a locality where a tree as hardy as Wealthy is needed, is sure to fail; the man who tries to raise Warfield strawberries on heavy land, better adapted for Parker Earle, must expect the cost of producing his berries to be a little larger than if he had fitted the variety to the soil more skillfully. The varieties that succeed best can usually be grown the cheapest, and usually, but not always, they will pay the best. In his effort to produce fruit as cheaply as possible, the fruit grower will naturally turn to the varieties that reach the greatest perfection on his farm, provided they are satisfactory in other respects.

COST OF FIGHTING INSECTS AND DISEASES.

The expense of fighting insects and diseases is a large item in the cost of producing fruit, and this expense varies widely in different sections. There are irrigated valleys in the west where it costs 50 cents per tree a year to protect apples from codlin moth; and there are other areas where apples can be protected from the same pest for 10 cents per tree, or less. Likewise it costs 30 cents per year to protect a peach tree from San Jose scale in some sections and nothing in other sections. Fire blight may ruin half the pear trees in one locality; another may be exempt. So one of the important points for a prospective fruit grower to look after, is the probable cost of fighting pests and diseases and the probable unavoidable loss because of them. He may find that one locality offers great advantages over another in this respect. This point is of large and growing importance in estimating the cost of producing fruit.

SINGLE-CROP OR DIVERSIFIED FARMING.

The cost of producing fruit will be influenced to a large extent by the kind of farming, whether only fruit is grown or mainly, with other crops or stock as a side issue. Seventy-five years ago, when most of the population lived in the country, the aim of the farmer was to produce all the articles that were needed to supply the needs of the family. He grew small quantities of nearly all the crops that would thrive on his farm. Now the farmer grows crops for market, not for his household. The growth of cities and increasing competition have made it necessary for the majority of farmers to specialize along some line and to grow only the crops or raise the stock that succeed best on their farms, and to purchase those necessities that they can buy cheaper than they can raise. Agriculture is becoming more and more specialized.

The business of fruit growing is one of the most specialized lines of agriculture. It is usually conducted on small farms under intensive culture, and but a few kinds of fruit plants are grown. Many fruit growers have no other business. There are economic advantages in this arrangement, but there are great disadvantages also. In many cases fruit could be produced cheaper if a certain amount of other crops were grown, or stock kept. It is all right for the manufacturer to produce but one article, for he can work at it all the year. The crop of the fruit grower, however, occupies his attention but a part of the year. There is much loss in unused capital, labor, teams, tools and other capital goods, during the remainder of the year.

I believe that there is a tendency to specialize too highly in fruit growing and that in many cases it would be more profitable for the fruit specialist to grow a certain amount of other crops, or keep a certain amount of live stock. He should, of course, make fruit growing his main business, and select such other interests as will most effectively fill in the gaps that appear in all kinds of specialized farming. Even though the crops he selects may not be nearly as profitable, in themselves, as fruit, yet the total profit from the farm for a series of years may be greater, since labor and the capital goods are kept in use. In short, the fruit grower should endeavor to have supplementary work which will not compete with the fruit crop; that is, which will not need a large amount of attention at the time that the fruit crop demands care. Certain lines of stock husbandry in which the animals are fed in winter and pastured in summer are practicable in some cases. Remember also the value of the

manure. Dairying, of course, would come in competition with the fruit crop in summer. In most cases some line of farm work can be found which will not encroach seriously upon the fruit crop, and which will make use of the capital goods and labor of the farm that otherwise would be idle. To that extent it will cheapen the cost of producing fruit.

Added to the cost of producing the fruit is the cost of placing it on the market. Here, also, are many points that make for profit or loss. The cost of harvesting and packing, the cost of packages, the distance of the orchard from the railroad or shipping point, the character of the roads between the orchard and the shipping point, the cost of transportation and commission—these and other points should be figured on. Every mile that an orchard is distant from a shipping point adds to the price at which the grower can put that fruit on the market at a profit. The cost of placing fruit on the market is as fluctuating as the cost of producing it. It is not within the province of this article to consider this point in detail.

ESTIMATES ON THE COST OF PRODUCTION.

The foregoing paragraphs have emphasized the fact that the cost of producing fruit is extremely variable, depending upon many factors, most of which the fruit grower can control. Any estimate must be personal estimate—now much it costs a certain man in a certain locality; and this estimate may be wide of the general average. Merely to show what it costs some men to produce fruit, I quote from some letters received the past month. The figures given include both the cost of growing the fruit and the cost of picking, packages and packing, but not the cost of marketing it. The estimates are for first grade fruit.

Apples—T. A. Farrand, Eaton Rapids, Mich., 25 cents a bushel; W. M. Pratt, Benton Harbor, Mich., 28 cents; Benton Gebhardt, Hart, Mich., 25 cents; T. C. Wilson, Hanibal, Mo., 30 cents; L. A. Goodman, Kansas City, Mo., 20 cents.

Pears—T. A. Farrand, 34 cents a bushel; W. M. Pratt, 30 cents; L. A. Goodman, 80 cents.

Cherries—T. A. Farrand, \$1.00 per bushel; Benton Gebhardt, 75 cents; W. M. Pratt, \$1.30; L. A. Goodman, 70 cents.

Plums—T. A. Farrand, 50 cents per bushel; Benton Gebhardt, 50 cents; L. A. Goodman, 50 cents.

Peaches—T. A. Farrand, 43 cents per bushel; Benton Gebhardt, 45 to 60 cents; W. M. Pratt, 40 cents; L. A. Goodman, 40 cents; T. C. Wilson, 30 cents.

Grapes—W. M. Pratt, 4-5 cents per pound; L. A. Goodman, 1 cent; N. G. Blalock, Walla Walla, Wash., 2 cents.

Strawberries—W. M. Pratt, \$1.20 per bushel; L. A. Goodman, 64 cents; T. C. Wilson, \$1.25; N. G. Blalock, \$1.20; C. B. Cook, Owasso, Mich., \$1.73.

Black Raspberries—W. M. Pratt, \$1.10 per bushel.

THE PROFITS IN FRUIT GROWING.

The profits in fruit growing depend upon the cost of production, the cost of marketing and market conditions. There is more variation in the income from fruits than from most other common farm crops. The average income, however, is higher than the income from other common lines of husbandry. The last census shows that the average incomes in different lines of farming are: sugar, \$5,317 per farm; nurseries, \$4,971; florists' establishments, \$2,991; rice, \$1,335; fruit \$915; live stock, \$788; dairy, \$787; cotton, \$430. But the gross income means nothing; it is the per cent received on the capital invested that counts. The average fruit farm of 74 acres returns \$760 worth of products; the average hay and grain farm of 159 acres, \$915; the average stock farm of 226 acres, \$788. Census statistics show that the average fruit farms return 9.6 per cent of interest on the investment. Very much larger returns than this are common—I know one man who, in a series of 14 years, has averaged 35 per cent yearly from his investment in an apple orchard. On the whole, the returns in fruit growing are apt to be larger than the returns in general farming, provided the same degree of intelligence, energy and capital is invested in each case. The fact that 83 per cent of the fruit farms of the country are owned by the men who work them, as compared with 48 per cent of hay and grain farms and 68 per cent of dairy farms, is further evidence that the fruit growers of the country are making their business pay. The census says: "Fruit farms have a value above the average, and a higher per cent of them are owned than of farms of any other class."

I have purposely left till last the most important item in the cost of producing fruit. This is the personality and the skill of the man. This counts more than all else; for the right sort of a man can over-ride obstacles, avoid mistakes and make fruit plants respond where a less skillful or less energetic man would fail. The fruit grower is so closely dependent upon physical conditions, which are unstable, and upon social and market conditions, which change from year to year, that it is not possible

for him to do his work by rules or estimate his expenses with the mathematical exactness of the manufacturer or merchant. It is constantly necessary for him to adjust himself to new commercial and physical conditions. There is, of course, an element of chance in the business, but this is very small as compared with the almost unfailing regularity with which success follows energy, skill and judgment.

Prosperity is determined most of all by efficiency. Most of the factors that enter into the cost of producing fruit are within the powers of the grower to modify. Good judgment in selecting a location may reduce the cost of raising fruit more than skill in growing the crop. While this subject can never be reduced to mathematical exactness, yet a fairly reliable estimate can be made and it is the part of a business fruit grower to figure out an approximate estimate. It may show that he is producing certain fruits or certain varieties at a loss and help him to weed these out, as a dairyman weeds out unprofitable cows with the aid of the scales and the Babcock test.

DISCUSSION.

Mr. G. J. Kellogg: The figures and representations of the fruits given by Professor Fletcher are from large commercial orchards from Missouri and Michigan. When we get right down to the cost of fruit raised here I should put the Duchess apple at ten cents a bushel, on a common farm; we have not commercial orchards to reduce the cost of the fruit industry. His report of strawberries agrees fairly well with our own, from two to four cents a quart; he gives it by the bushel, same price, but I have been trying to raise pears for fifty years. I used to say they cost \$10 apiece, I got down to five after a while, while now I can raise them for five cents a piece. It depends on the locality and somewhat the man and somewhat the loss and experience for a number of years. It is the locality that makes the difference. I think it is a matter of guesswork when you come to figure the cost of fruit to the farmer. It is not the dollars and cents, it is the health for his family, they pay, no matter what they cost, they pay.

Prof. Hansen: I would like to ask Prof. Fletcher as to the prospects of planting more summer and fall apples for cold storage instead of planting winter apples that are not as hardy in the far north.

Prof. Fletcher: I am not familiar enough with conditions in the far north to give any positive opinion of value on that, but my general opinion would be that the prospects are good.

I believe that the winter apple business has been slightly overdone; in Michigan at least I know many growers who are now putting out fall and summer apples and have made them a wonderful success, much more so than the winter sorts. I wish somebody who lives farther north than I do would answer that.

President Coe: Perhaps you can answer your own question, Prof. Hansen.

Prof. Hansen: I wanted to get some light on the subject myself. I will say, though, that for a large part of the northwest, farther north and west than here a good ways, it seems to me that the fruit market is in the possession of the banana and orange people and we do not see enough of these early apples. We really have to wait for the eastern apples; the summer and fall apple business is not overdone, in fact, we get hungry for early apples and it seems to be a question of transportation rather than anything else.

Mr. Howard: I have been experimenting a little, but I think it would pay to raise more of the fall and winter apples and hold them in cold storage. I think there are many more that will agree with me, because we have cold storage now in the cities that will hold them almost perfect; I see no reason why we have to ship in and pay the freight when we can raise them so near the market and supply the market without having to ship so far.

Mr. Philips: What success did you have in keeping them in your cold storage cellar?

Mr. Howard: It keeps them perfect; I did not put up any ice a year ago, but I put up ice two years ago and it kept them until June. I kept Duchess until February perfectly sound.

Mr. Philips: Had not they lost some of their quality?

Mr. Howard: Yes, they had lost their quality and flavor, but the apples were sound, without any blemish.

Mr. Philips: How long did you keep the Wealthy so that they were really good?

Mr. Howard: All winter long, they were as crisp as could be.

Mr. Kellogg: What does it cost you for storage?

Mr. Howard: The Duchess cost me about five cents a bushel.

Mr. Philips: What does the Wealthy cost?

Mr. Howard: It does not cost me to exceed ten cents a bushel; I don't know but I am a little more favored in location than most of you, but it does not cost to exceed that with me.

The President: What is the capacity of your cold storage?

Mr. Howard: About one thousand barrels.

The Secretary: I want to ask if in the opinion of the members conditions in Wisconsin are not more favorable to growing fall and summer apples than farther east, south or southwest? It has been my opinion for some time that we can raise better Duchess and Transparent and summer apples in Wisconsin than they can in other parts of the country. Now, honestly, I fail to see the point in raising Duchess apples and in keeping them until January and February. It seems to me what the people of Wisconsin should do today is to raise Duchess apples and put them on the market, supply the great markets of the northwest, like Minneapolis, St. Paul and Chicago. I have maintained for years that this is a line of apple growing in which Wisconsin can excel. We can supply the entire northwest with summer apples, putting them on the market in the season of summer apples. When we keep a Duchess apple until February we place it in competition with the Northern Spy and other apples that are a better quality. I firmly maintain that it is up to the fruit growers of Wisconsin to raise summer apples and let the winter apples be grown largely by the people in the Ozark region and Virginia and New York and other great apple regions. Just the same in all other products. Certain regions of the country are adapted to certain products and I believe Wisconsin is adapted to growing summer apples, and I believe we can plant thousands and thousands of acres of Duchess and Transparent and put them on the market to great advantage. I think it is merely a question of transportation and marketing, there is no question of over-production. You can easily overstock your local market with a few barrels of apples, but when we solve the question of distribution it will be entirely different.

Mr. Howard: If you raise Duchess apples on a large scale you certainly will have to hold them. If you ship them to the cities, the first thing you know it will be overdone and you will not get anything. I have held my Duchess at home until the Duchess were gone and I got \$3.50 a barrel for them in the city when the main crop was cleared up, but if I had put them on the market when they were ready to ship I would not have got the freight out of them.

Mr. Toole: In regard to what Mr. Howard has said about keeping the Wealthy, we do not need to confine ourselves to the Wealthy; there is the Plumb Cider and others that we have, quite a variety of them and I will say that the Wealthy when kept in the condition that we know it can be kept, is a far better apple than any of the eastern varieties that come into the Bara-

boo market, and if we can place the Wealthy that are grown in Sauk county on the Baraboo market, there would be but very little call for the Baldwin and other apples of poorer quality which come from New York.

Prof. Hansen: I simply asked the question to start the discussion. That is exactly what I wanted to get hold of. A year ago last summer I had the pleasure of seeing thousands of acres of apple orchards down in Arkansas and Missouri; they were all winter apples and the question came to my mind, where shall we get our apples before the winter apples come in? The question of distribution has not been solved by any manner of means in the northwest. If the early apple men were as well organized as the banana and orange men, they would not leave these immense market to these people; you would have your nice juicy Duchess and Wealthy apples in their place. I think Prof. Crane field has hit the nail on the head when he said that if you at the north here can raise these earlier apples, the Duchess and especially the Wealthy and can put them into the market you can get ahead of the southern people, but you must hold them for a time, be able to solve the question of cold storage and the question of distribution, as Mr. Howard has suggested, and there is an immense field. It has occurred to me in traveling about the country that there is a lack of apples in the proper place. You sell apples at twenty cents a bushel, Duchess apples rot on the ground, when there is a whole empire northwest of here that should have them.

Dr. Loope: I want to chip in and inquire what basis you are arguing upon? Are you arguing for the farmer and for the home, or are you arguing in a commercial sense? There is a vast difference between the two. The farmer has no cold storage to put his apples in, but if he is near to a cold storage plant, he can keep his summer or fall apples, he can keep them so as to provide himself with apples all through the winter and into the spring, all through the year, if necessary. One has to discriminate a little too in regard to the varieties that one uses for cold storage. McMahon's White cannot be kept in cold storage successfully beyond December, I put it as a broad proposition that you cannot do it. You may have some good McMahon's White in cold storage after December, some that will keep well, but you can keep them as long as that in your cellar, pretty nearly, and if you keep them in cold storage, they are going to scald and are not going to be good for anything, they are going to deteriorate. The question of the Duchess being in cold storage any length of time does not appeal to me at all, because when they are kept in cold storage for six weeks they are not

good for anything. The farmer has to have some plan whereby he can keep apples in his own way, he cannot get cold storage, so that you are up against a proposition there very soon in the question of the fall apple and the capability of Wisconsin growing any amount of Duchess apples, and if you have the Wealthy and a few of the fall apples and can put them in cold storage, you can have apples, otherwise you cannot. If you pick the Wealthys and the Longfields after they are fully ripe, they will keep well for a while. I noticed some of both of these on the tables and I will say that I never saw a finer lot of Longfields at this time of the year except a few that are kept in a cellar where one has to sort them over and keep out the rotten ones. It is possible to keep them if you let them get fully ripe and there is no question but what we can keep the Wealthy until March 1st, but without cold storage you are not sure of keeping them longer. There is no question, as Prof. Crane field has said, of the amount of apples that can be raised in Wisconsin, but our friend from Minnesota has said that in order to sell a Duchess, you have got to sell it when it first comes on the market, or to hold it a little longer, but in my opinion you must not hold it very long, otherwise it loses all its quality. That has been my experience. I have tried cold storage to some extent. But Wisconsin can raise summer and fall apples, I emphasize the fall, because they are better. You do not want anything better than a commercial orchard of fall apples of the right kind and if you have cold storage you can keep them later. I would like to ask Mr. Howard in regard to his cold storage and what it cost him?

Mr. Howard: I do not know that I can give you the exact cost, because I did so much of the work myself, the timbers were sawed out of the woods, but the system is the Bowen system of St. Paul and the system is perfect. That of course I had to pay for, I think I gave \$190 for putting the system in and they did the inside work in putting it in.

The Secretary: I beg your indulgence just a moment more to emphasize what Prof. Hansen said. There are people who want apples and cannot get apples, and in reply to the question of Dr. Loope as to whom we are speaking for, the farmer or commercial orchard man, I say, the commercial orchard. It is our duty to develop commercial orcharding in Wisconsin, I think it is high time, and I beg leave to insist that we can easily grow and dispose of more summer and fall apples than we are now growing. I venture to say that there are at least eight million people within twenty-four hours of any point in the state of Wisconsin by rail, residents of cities, that want apples

and cannot get apples. There is Chicago and other cities are available; if we had Duchess apples to pick to deliver to them a few hours after they are picked, I am sure they would use them. It is all a question of distribution. Duchess apples are not more perishable than strawberries and we distribute our strawberries and put them in the hands of the consumer within twenty-four hours, or else they are lost. When we have solved this question of distribution, we have solved the problem and we can eliminate cold storage.

THE M'INTOSH APPLE.

- (1) Its History.
- (2) Distribution in Wisconsin.

R. J. COE.

Secretary Cranefield has ideas of his own and one of them is that instead of trying to discuss all the known varieties of apples at any one meeting of this society we shall take up just one and find out all we can about that one variety and then let it rest. This year it is the McIntosh. I give its history as found in Prof. Beach's great book "The Apples of New York."

"This variety belongs to the Fameuse group. It is adapted to a wider range of localities than is the Fameuse. The fruit is very attractive in appearance, of bright deep red color and good size. The flesh is very tender, perfumed and delicious. It is desirable for local markets and special trade but because of its lack of firmness it is less suitable for general handling. As grown at this Station it begins to ripen in late September or early October. In western New York it cannot be expected to keep much later than October in ordinary storage without considerable loss but in cold storage it may be had until December or January. When grown in more northern or elevated regions it is often held in good condition till midwinter or later. It is susceptible to scab but this may be readily controlled with proper treatment. The crop ripens unevenly and a considerable portion of the fruit is liable to drop before it is ready to pick. On this account it is best to make two or three pickings. In some localities the tree is said to be a somewhat slow grower and not satisfactorily productive, but more often it is found to be a rather strong grower, hardy and healthy. It comes into

bearing rather young and is a reliable cropper yielding good crops biennially and sometimes annually. It has not been sufficiently tested to demonstrate fully its value for commercial purposes but it is regarded by many as one of the most promising varieties of its class for general cultivation in New York.

Historical. Originated as a chance seedling on the McIntosh homestead, Matilda township, Dundas county, Ontario, where Allen McIntosh began the propagation of this variety in the nursery about 1870. It has been widely disseminated. It is now commonly propagated by nurserymen and its cultivation is on the increase in New York.

TREE.

Tree vigorous with numerous, small, slender laterals. Form rounding or spreading. Twigs above medium to short, straight or nearly so, rather slender; internodes long to below medium. Bark bright reddish-brown, lightly streaked with scarf-skin; slightly pubescent. Lenticles quite numerous, small, oval or elongated, raised. Buds deeply set in bark, medium to below, plump, obtuse to acute, free, slightly pubescent.

FRUIT.

Fruit above medium, sometimes large, pretty uniform in shape and size. Form roundish to somewhat oblate, regular or faintly ribbed, obscurely angular. Stem short, stout or moderately slender, usually not exserted, often with regular protuberances. Cavity large, acuminate or somewhat acute. Calyx small, closed or partly open; lobes short to long, narrow acute. Basin pubescent, rather small, medium in depth, narrow, abrupt, smooth or obscurely furrowed.

Skin thin, moderately tender, smooth, readily separating from the flesh, clear whitish-yellow or greenish washed and deeply blushed with bright red and striped with carmine; highly colored specimens become dark, almost purplish-red with the carmine stripes obscure or obliterated, overspread with thin, lilac bloom. Often the effect of the deep red is heightened by lively contrast with one or more spots of the clear pale yellow ground color where some twig or leaf pressed closely against the growing fruit. Dots whitish or yellow, usually very small.

Calyx tube short, conical or funnel-shape with broad limb. Stamens medium to basal.

Core medium size, usually abaxile; cells usually wide open;

core lines nearly meeting. Carpels roundish to elliptical, narrowing toward base and apex; smooth, much concave. Seeds medium brown, rather large, acute.

Flesh white or slightly tinged with yellow, sometimes veined with red, firm, fine, crisp, tender, very juicy, characteristically and agreeably aromatic, perfumed, sprightly, subacid, becoming mild and nearly sweet when very ripe, very good to best for dessert.

Season October to December or later."

I had hoped to have some of the apples here at this meeting and wrote to Mr. John Reis of Ithaca who, I thought, would be likely to have some on hand, and in his reply he said "I am sorry to say that I cannot furnish any of the McIntosh apples for the winter meeting but the fact is that they go very fast with us. It is the best flavored apple there is. We have nothing to compare with it."

DISTRIBUTION IN WISCONSIN.

I cannot say how generally this apple has been planted but think not to any great extent. Am hoping the discussion will bring out some knowledge along this line.

THE MCINTOSH RED.

- (1) Its Place in Wisconsin Orchards.
- (2) Is it better than the Fameuse?

B. E. BINGHAM.

I must confess to a limited amount of observation and experience with the subject of this paper and were it not for the fact that the majority of my hearers are similarly placed I should hesitate about offering any opinions on the subject whatever. As it is I shall give you briefly the ideas I have formed from my limited (knowledge) observation, trusting that the discussion will bring out the truth or error of my opinions for it is the truth we are seeking in all our work. Truth means success. Errors lead to failure.

I presume that you are all more or less familiar with the McIntosh Red. I mean the apple itself. In size it is about the

same as the Fameuse. In coloring it is better. The quality of the fruit itself is very similar to that of the Fameuse. Its season is considerably earlier.

So much for the apple itself. Now the wording of this subject presupposes a claim of the McIntosh apple to a place in Wisconsin orchards. Now just what that place is to be time alone can tell, but if it is a good thing and is destined to take rank with the few good varieties of apples suited to our soils and climate, a thorough discussion of its qualities, good and bad, will most quickly establish it in its proper place. To consider this question fairly we must do it with reference first, to the object for which it is grown; second, the grower; third, the location.

Without attempting to discuss these points separately I shall try to show what bearing these things have on the question.

There are two classes of growers to be considered and with them we can also discuss the object for which they are growing apples. First, those who grow apples for market and those who plant only small orchards, chiefly for home supply of fruit, and sell only what is grown in surplus in the years of good crops. This class of growers simply plant and cultivate or do not cultivate, as the case may be. They do not consider the business of enough importance to prepare themselves to fight insect pests and fungi as does the commercial grower. In spite of all that is written and published in farm journals, fruit papers and in fact in the weekly country papers, there seems to me to be a woeful lack of comprehension of the simple yet vital points in regard to spraying fruit trees to combat these foes. To those of us who have had experience along this line there seems to be nothing difficult to the task except the eternal watchfulness and the work, for it is work, work, work. An incident will illustrate the point. One day I chanced into a drug store just as a neighbor farmer had asked for a quantity of borax. "That is what I want, ain't it?" said he turning to me. "What do you want it for?" I asked. "To spray my fruit trees," he replied. On inquiry I learned that he had read of Bordeaux mixture but thought there was some mistake in print and borax was meant.

To others the matter is wholly unintelligible and as difficult and mysterious to them as a doctor's prescription and, therefore, after planting the trees let nature do what she will for them and take the result; then say it doesn't pay to raise apples, even for home use, can buy them cheaper. So what we ought to do is to get a list of those apples that will do the best for the farmer with least amount of spraying and attention or

with none at all, until he has learned how to attend to them better. In the meantime we must simplify and disseminate the knowledge of scientific fruit culture until all shall be able to appreciate the simplicity of it and apply it and note the wonderful advantages gained by its use.

Should such a grower ask me the question, Is the McIntosh better than the Fameuse? I should say: do you fertilize and cultivate your trees? If you do, yes. If you do not, no. For while the Fameuse apple does better under adverse conditions, it is prone to scab. The McIntosh if left to grow in sod will always show its neglected condition. It will not scab like the Fameuse.

Only this fall I saw hundreds of bushels of Fameuse apples practically worthless for market that had the trees been sprayed thoroughly with Bordeaux mixture at the right time, would have been worth 40 cents a bushel at the orchard instead of being worth less than the picking. Nor is this all. A variety as subject to scab as the Fameuse, if planted by the average farmer who makes no attempt to fight the fungus, will result not only in a very poor quality of Fameuse but the scab spreads to other trees and makes the apples on them worthless also.

My observation of the McIntosh apple leads me to believe that it is much less liable to scab than Fameuse and the tree is quite as hardy as far as climatic conditions affect it.

The tree responds very quickly to good care. The fruit spurs are formed in abundance and are well distributed on the larger limbs. The tree branches well and is capable of holding up its fruit as well as any tree I know.

Now for the grower who plants for home use and home market for his surplus. I know of no better apple for him than the McIntosh if he live near a city of 2 to 10 thousand, for as I said, the coloring of the apple is fine, quality as good as Fameuse, flavor tasty, the season earlier than Fameuse and it is destined to find a ready market, for good dessert apples are not plentiful.

Now as to the commercial grower, the man who has planted an orchard with the idea that he expects to make it pay and is determined to master the details of spraying, fertilizing and cultivation and who wishes to grow apples that will sell in the markets in competition with fruit from all sections I would not say that the McIntosh is any better than Fameuse. This grower you understand sprays anyway. He knows he must, and if he does as well as they do in Ohio on Mr. U. T. Cox's fruit farm and others of whom we know, he certainly has no

reason to complain of the results obtained from an orchard of Fameuse trees.

So in conclusion I would sum it up about like this; for the thorough, practical commercial fruit grower the Fameuse in my estimation still holds its place in the orchard.

With my observation and experience the McIntosh Red will no doubt give the amateur grower and the old farmer better apples, less scab, larger apples and a better selling article when he has a surplus to dispose of.

For us all I think the McIntosh deserves a place in every orchard with the Duchess, Wealthy, McMahon and N. W. Greening to the exclusion of many varieties that have no valid claim to a place.

DISCUSSION.

Mr. Sperbeck: I have had some experience with the McIntosh Red and am growing it at the present time. I have some here on exhibition and Mr. Coe's paper I think presents it very thoroughly. They are very much in advance of the Fameuse, to my notion, they are a very nice apple. The tree is a stronger and better grower and the season with me is fully as late. I had McIntosh Red kept in a cellar and was using them in January.

Mr. Patten: The question arises in my mind in discussing this apple, that it has been before the public now for quite a length of time. It has been known in Wisconsin, it has been known in Iowa, it has been known in the east for a long time and if it is an apple that is so valuable that it should now be introduced to the public, I would like to inquire why it has not made its appearance and demonstrated its usefulness to the public? Now, when we consider this question of producing fruit, we are reminded of a paper read by the gentleman from Michigan that there is a question of a money consideration in this matter in view of which we should be very careful in recommending planting, and I submit that the Wealthy all over Wisconsin, from my experience and observation and the fact that it has taken a place all over this country and the McIntosh having taken no place at all, that to the commercial man and to the farmer the Wealthy is worth ten just such apples as the McIntosh. It is a larger apple, it is fully as beautiful, it is a better apple and has been demonstrated to be a thoroughly good cold storage apple, not only for one month but for six months, and

so I would like to inquire, Mr. President, where the good judgment would come in in taking up with a new apple like the McIntosh? I want to go a little further with it. When I went from this state perhaps thirty years ago, it was considerably longer than that since I left Madison, but about thirty years ago I planted McIntosh in comparison with Fameuse, Tolman Sweet, Golden Russet and all that class of varieties that are pretty nearly on an equal grade of hardiness, and the cold winters wiped out the McIntosh and the Fameuse, although after the injury they held on and recovered and bore quite a good deal of fruit. I again tried the McIntosh on a more favorable location several years after that. I planted in that experiment quite a good many Russian apples and planted a few McMahan's White, St. Lawrence and McIntosh, and Canada Baldwin and Wealthy, and a good many others that I will not enumerate. But there stands today the St. Lawrence, a large tree ten inches in diameter, never having borne a peck of apples; the McMahan is fully as large, never has borne two bushels of apples in any one year; the Greening stands by the side of it that has borne at least fifteen bushels to one from the McMahan; the McIntosh died out entirely; the Canada Baldwin stands there the hardiest of all the new seedlings that have been introduced, and so I am led again to inquire—of course I have no objections to this apple being tried, but if you are going to do anything more than try it as an experimental apple, I should say that the facts are against doing so.

The President: We are very glad to get just such an experience as this. That was just why this was put on the program, for we are not trying to recommend it, we are trying to find out whether it is worth while for Wisconsin people to try it.

Mr. Bingham: I do not wish to be understood as recommending that apple as a commercial variety for Wisconsin, but I do think there are many places in the state of Wisconsin where the apple can be grown and money made on it for the local market. You understand that there is always a call for good eating apples, calls for an apple that one can ask more money for than for the Wealthy. You can easily ask \$1.50 a barrel more for this apple than the Wealthy, I know it by experience and I think it has a place in some localities, there are places where the apple ought to be tried. It is a larger apple than the Fameuse, I think it will sell for more than the Fameuse from the fact that it is a more showy apple, not from the fact that it is a better quality, it may not be a better quality, but it will sell for more money than any Wealthy I ever saw.

Mr. Sperbeck: I think it is a better cooking apple than the Snow, it is more tart.

Mr. Phillips: The Snow apple with me will stand eight or ten degrees more cold than the McIntosh. As an apple for profit I would not plant it.

Mr. Bingham: We have Snow that have been injured in the nursery and McIntosh that came through nicely. It is a matter of location.

Prof. Blair: I might say a little more about the McIntosh Red apple from the fact that it is an apple grown very largely in the section where I come from and it is an apple that I have grown myself personally for some ten to fifteen years. In the first place, I do not believe the McIntosh Red possibly will be a good tree on some of your dark rich soils, unless you pay special attention to the curing of the wood. It is a tree that is very likely, if you give it a chance to do so, to keep on with its growth late in the fall and consequently you will be liable to lose it through winter injury. This of course can be overcome by proper cultivation and by the use of cover crops later on, sowing cover crops along the first of July and getting the wood well ripened up. So far as hardiness goes, it is with us much hardier, we think it is any way, than the Fameuse. The Fameuse you possibly know, a great many of you anyhow, is the apple that we think the most of in the Province of Quebec, in fact we can ship the Fameuse to England and get five dollars a bushel box for it. That has been done time and again by those who make a practice of picking up these apples and shipping them. Of course there is that other point that you must remember in connection with both Fameuse and McIntosh Red, and that is that you cannot grow Fameuse and McIntosh Red and make money at it at the prices that you can the Ben Davis and Duchess and some winter apples. That is one of the impossibilities. The Fameuse and McIntosh Red are dessert apples and they are apples that are hard to grow unless you pay particular attention to spraying and handling of your trees so as to get the crop in the very best condition possible so far as color is concerned and also to pick it and handle it in the very best possible manner. You cannot ship Fameuse and make a success of it in barrels; you cannot pick the McIntosh Red and make a success of it in barrels. I do not believe it will ever be possible for you to do so, because it is an apple, if handled roughly, that bruises and consequently will deteriorate. Now, we have in our cellars at McDonald College still Fameuses that are in excellent condition and we can keep them in excellent condition in common storage until March. The McIntosh

Red we think will stand somewhat longer in average storage. I do not say that we can do it here, because possibly your season will mature the fruit sooner and it will not stay as long in average storage as it will with us. In Nova Scotia where I had most of my experience in growing McIntosh Red we had over 350 varieties of apples, including Patten's Greening and different varieties of Russian apples and different American standard varieties that are grown all through this part of North America and we found that out of over three hundred varieties the McIntosh Red was the most attractive and the apple that we could handle and sell to best advantage of any apple that we had in the orchard. I do not say that that will be the case here, but I do say as far as quality of this apple is concerned, it is equal to any; it is equal in my mind to the Gravenstein, which is the famous apple in Nova Scotia. Do not think that we consider this a winter apple; we think we have to get it out of the market by Christmas time. There are several things to be remembered in connection with this apple; in the first place, you cannot grow this apple profitably without spraying; second, you cannot grow it and handle it as the average apples are handled, and make it profitable; third, you cannot grow the trees here without paying particular attention to the cultivation of trees early in the spring and ripening up the wood in the fall by growing some cover crop. The late fall rains might start a second growth and there would be an injury to the buds that are liable to grow where trees are not ripened up properly. There is another point too that I wish to refer to and that was spoken of here by some one, that is this, that the Fameuse apple is not a good cooking apple, we do not consider it such; the McIntosh Red on the other hand, is considered with us to be a very good cooking apple, much superior to the Fameuse.

Mr. Menn: How about the blighting of the McIntosh tree?

Prof. Blair: I never saw twig blight on the McIntosh, I do not believe it is subject to blight. As I say, I do not think it is a tree that should be planted on dark, rich soil.

Mr. Sperbeck: Is it not a fact that the McIntosh Red is a great deal less liable to the apple scab than the Fameuse?

Prof. Blair: Oh, yes, decidedly so. The Fameuse I think is the one apple of all others that requires more careful attention to spraying to keep it free from scab than any other apple we know of.

Mr. G. J. Kellogg: The idea has been advanced by our friend Patten that the apple has been before this country, as he says, for thirty years, and what kind of showing has it made? If it is so fine, so good quality and so profitable, why are not

more men growing it? At the State Fair two years ago there were three or four apples presented as a McIntosh and Prof. Green could hardly tell what it was.

Mr. Bingham: I think I can explain that. The McIntosh Red is a very poor nursery tree, therefore the nurserymen do not like to grow it. You will find it is rather against the inclination of the agents to talk it, they want to talk the Snow apple, because it is a better nursery tree. They would rather sell you apples like Patten's Greening or Northwestern Greening and some other varieties that are poor in quality rather than talk an apple of good quality. Furthermore, what progress have we made in apple growing in Wisconsin? There are no commercial orchards here, there are no men attending to their orchards in this state the way they are attended to in other states, that is the reason we cannot get apples of good quality.

Prof. Sandsten: I agree very heartily with Mr. Bingham's statement, I think he is about right, but there is another thing I might add to it, and that is that I hardly think that the McIntosh apple has been tried extensively enough in the fruit growing sections of the state. I know it has been tried on the heavy black soil in the southern part of the state and in Northern Iowa, but it has not been tried to any extent in soil better adapted to apple growing in the central and southeastern and southwestern parts of the state and we have not given it a fair showing.

Mr. Patten: I just wish to call attention to the description that the gentleman from Canada gave of the habit of growth of the McIntosh apple to show you that it will never be a success in this country from the fact that it does not mature properly and that our warm falls will start up a second growth on that tree. You gentlemen have seen it in other varieties of similar character and when those warm falls come and the rain comes afterwards, the McIntosh gets a second growth and with the hard winter that follows in this country the McIntosh goes. I will not say that you have not a territory in Wisconsin where the McIntosh may be grown with success, but if you have, right here in Southeastern Wisconsin, along up the lake, along up to Waupaca county to the westward, that would be the western limit of the successful growth of the McIntosh, east of Madison and I just wish to go on record now as saying that the McIntosh will never prove a success west of the city of Madison or west of Waupaca county.

Mr. Reis: We have grown the McIntosh apple in Richland county and it has proven entirely hardy. It is as hardy as the Fameuse or any of those, well, as hardy as Patten's Greening

and has borne fully as well as Patten's Greening, in fact more so, within five rods of a Patten Greening tree, and it will bear fully as well as the Wealthy and it has borne more apples with us than the Wealthy has and it has been a better quality and even larger size. They do not color up as well as do some of the McIntosh that we get from other parts of the state, but they color sufficiently to make fine looking apples. We think that we would have no trouble at all in selling them at a high price if we had any more planted. We have only a few trees and never had any chance to put them on the market, but as far as our experience is concerned I think it is as hardy as any trees that we have.

Mr. Bingham: I would like to ask the gentleman if he lives west of Madison? (Richland Center is 55 miles west of Madison. Ed.)

Mr. Reis: The trees are about fifteen to sixteen years old and they have proved annual bearers. They have never borne exceedingly heavy in any one year, but they have borne quite a few apples in every year.

Mr. Philips: I was going to corroborate what Mr. Patten says. We had it growing sixteen years on good, rich black soil in a protected place and about two years out of five it will bear quite a crop of apples, but I have seen it in the late fall make a growth of sixteen inches in length, I suppose they were mature enough for scions and such winters as we have had they will kill back the whole growth.

Mr. Sperbeck: I grew these (referring to plate of McIntosh apples) at Oshkosh, and I never had any killed back on my trees, never a limb.

Mr. Reis: I have had both McMahon scions and McIntosh scions the last few years and I think there is a greater proportion of the McMahon scions that show a second growth during the season than the McIntosh. I have not found any McIntosh scions that have shown any signs of renewing growth during the season, that is, not as great as the McMahon has.

The President: We have to close this discussion. There has been one question asked twice, and that is, if the McIntosh apple is such a good apple, why has it not been more extensively planted and the answer is that it would have been if it had been advertised like the standard apples, if somebody had a big stock and wanted to dispose of it.

THE SAUK COUNTY APPLE.

(Sometimes called the Hanko.)

ALBERT REIS, Ithaca, Wisconsin.

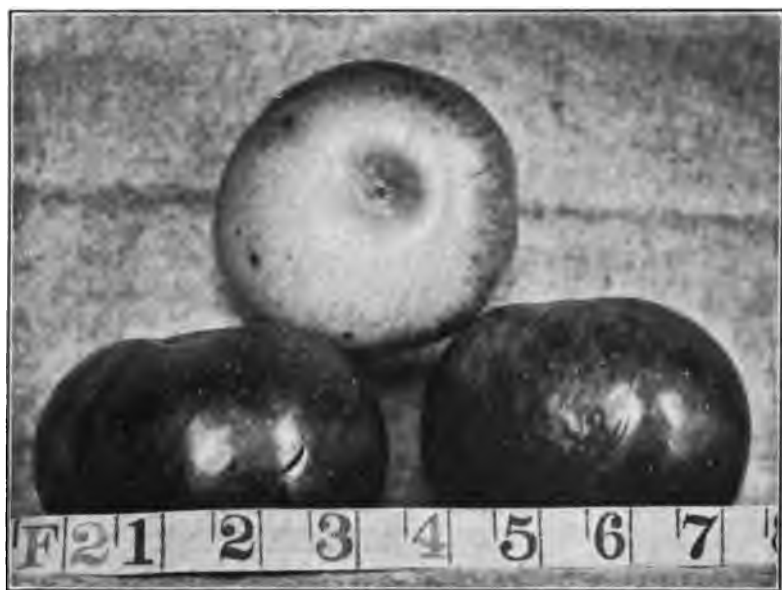
I understand that it is the custom at every winter meeting to give the description and history of such seedling apples of sufficient merit, as have been brought to the notice of the Society.

Since the introduction of the Duchess, McMahon's White, Wealthy and Wolf River, these seedlings have had little to recommend them to the apple growers of the state, especially the commercial growers, save, that they were as good as these now standard varieties and might possibly be able to fill the place occupied by them. The majority were Duchess seedlings, the chief claim for which were, that they were later in season than that grand old variety, but not later than the McMahon and Wealthy and not better in any other respect. Among the winter varieties introduced, the Newell and N. W. Greening are generally rated best, but neither of these varieties are planted by growers who are after the kinds that "make money". In fact, up to this time, Wisconsin has had no known winter variety which could be grown with any degree of profit. Therefore, I think that it will interest you to know that in this Sauk County apple, which we have called the "Hanko" after its originator, we have an apple, a winter apple, with the keeping qualities of the N. W. Greening, as large as the Wolf River, better quality than the Wealthy, with a tree as hardy as the Duchess, and much more productive than any of these varieties.

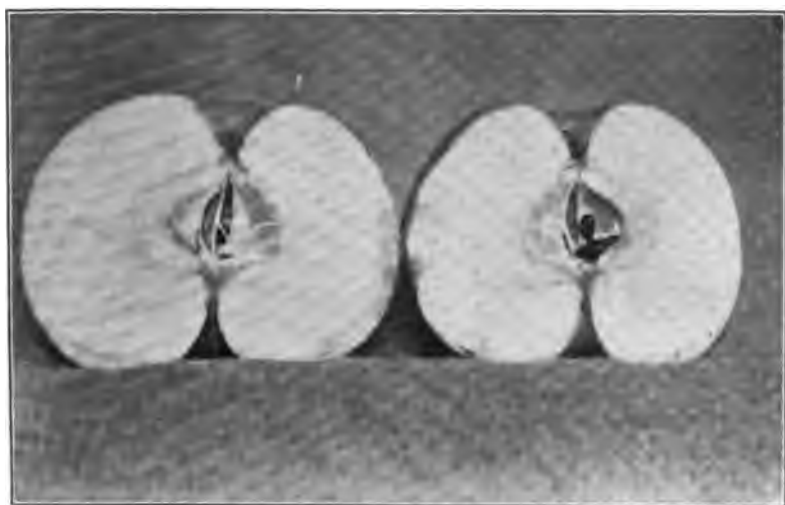
You have all no doubt read the description of this apple, given in the Wisconsin State Horticultural Society Bulletin No. 10, under the heading, "A Remarkable Apple," a very fitting title, as it truly is a remarkable apple.

The tree was planted, along with others, about forty-four years ago, by the father of the present owner, Mr. Ed. Hanko of Sauk County, Wisconsin. This tree was known in the family as the "Seedling" which it undoubtedly was, as many of the people planted seedlings at that time, there being hundreds of them in that vicinity now bearing. At any rate, no one who could be considered an authority in the matter has been able to identify it with any other known variety.

Two years ago last summer, Mr. Hanko while engaged in conversation with my father, John Reis of Ithaca, Wisconsin,



From photograph of Hanko apple.



Cross section of above.

told him that he had an apple tree on his farm which was better than any kind grown in that vicinity, that he didn't think there was another tree like it in the state, and that he was afraid the tree would die some day and this valuable variety would be lost. That fall my father secured all the scions on the tree and grafted them.

This tree has never been pruned nor sprayed, never given any attention or care whatever, except to pick the fruit, yet, for a great many years it has never failed to bear a large crop of apples. No record of the annual yield was kept excepting the last three years. In 1904 it bore sixteen bushels, in 1905 (an off year) fifteen bushels, and in 1906 the yield was seventeen and one-half bushels, notwithstanding the fact that the tree was struck by a hailstorm last July that totally ruined the crops of such varieties as Wealthy, McMahon, Fameuse, etc., which stood in the same orchard, and not over a rod or two away.

Is there such a thing as one variety being freer from the attacks of the codling moth than others? Past experience with many varieties has led me to believe there is. Mr. Hanco is very positive in the statement that the Hanco apple is much freer from worms than any other variety he has. Now it is a well-known fact that those sorts, where the apples grow in clusters, sometimes three or four, sometimes even six or eight or more, close together, and touching each other, offer the very best kind of a place for the female codling moth to deposit her eggs, and the very best kind of a place for these same eggs to hatch and grow into very hungry and exceedingly active worms.

The Hanco apple almost invariably grows singly, rarely do you find two hanging together. This perhaps explains its freedom from worms. The fruit has also always been singularly free from apple scab.

Another point very much in its favor is its ability to hold the fruit until fully matured, there being practically no wind-falls at picking time. This last season will serve to illustrate this quality. The night before the apples were picked, one of the worst windstorms of the season passed through that section, but even then not a peck of apples had been blown off the tree, although the fruit was fully matured. This apple matures about the 10th or 15th of October, but can be picked considerably earlier. Specimens picked September 1st have kept in excellent condition in common cellar storage for five months, and were nearly as good in quality as those picked when the fruit was fully matured, although not quite as large or highly colored.

The tree is of a rather low and spreading habit of growth,

making it easy to gather the fruit. It has borne its large crops without propping or tying up the branches, carrying the fruit with seeming ease, the branch never breaking down.

It has never been known to blight. As to hardiness, the fact that it has stood over forty years in a country where the variations and extremes of temperature are as great as any county in the state, would seem to insure that; the tree being in excellent condition at the present time.

The fruit keeps well in ordinary cellar storage until March or later. In quality it is better than any other apple originated in this state, ranking with the Fameuse, Jonathan, King and Grimes Golden. In appearance it resembles the King somewhat, being even brighter red in color. In point of flavor it excels this variety. The fact of its resemblance to the King would recommend it as a good selling variety, as the King in its season, always tops the market. In size the apple is larger than the McMahon White taken from trees at all approaching the Hanko tree in age, and fully as large as the Wolf River or N. W. Greening grown on old trees.

The very short stem of the apple coupled with its oblate form make it very easy to pack for marketing.

No other apple which can be grown in Wisconsin combines so many points of excellence. Those who are best acquainted with this variety are most enthusiastic, and the more you see and learn of it, the more enthusiastic you will become.

I am proud to have given before this society, the history and description of this, the greatest of Wisconsin's seedlings.

THE HANKO SEEDLING APPLE.

C. A. HATCH, Richland Center.

HISTORY.

It is supposed to be a chance seedling that came with a bill of trees purchased of Freeborn and Hatch of Ithaca, Richland county, Wisconsin, about 1868, but of this there is no certainty as the original planter has been dead some years and the only thing surely known is that the rest of the trees were purchased there. The tree now stands on the boundary line between two fields the row containing one Duchess, one Tolman Sweet and one Transcendant crab. It has neither been pruned or sprayed in its whole history, yet appears to be quite healthy, showing



The Hanko Tree, photographed November, 1906.



Common Barberry.

but little fire blight while Tolman and Transcendent only a few feet away are full of dead twigs and limbs. It has not failed to produce annual crops of fine apples for several years. The growth is strong and vigorous, rather on the Alexander type, upright in habit and but one poorly formed fork in the tree.

FRUIT.

Size medium to large; shape roundish, slightly flattened, irregularly round; stem short; cavity moderately abrupt; calyx closed; core medium open; flesh yellowish, coarse, juicy; quality fairly good to good, sub-acid.

Color greenish yellow striped with red to quite red in the sun, few brown dots near stem.

Season, winter.

The Hanko apple has this to recommend it to the public,—it is perfectly hardy, not susceptible to fire blight and an annual bearer of apples that compare favorably in quality with the Baldwin.

One expert on Wisconsin seedlings said it was the best of them all for quality. It is certainly worthy of the attention of the Horticultural Society.

Mr. Brackett chief of the Div. of Pomology, Washington, D. C., writes as follows of this apple:

"I do not recognize it as any of the named varieties and therefore think it a seedling. The apple is very handsome in appearance and in quality it is good to very good. I think it worthy of further trial."

Prof. S. A. Beach of the Iowa Agricultural College says:

"I am exceedingly interested in what you have to say with regard to this variety. There is an apple which has been grown to some extent in western New York which I would like to compare with this apple if it is possible to do so. The variety I refer to is the Twenty Ounce Pippin. It seems to me that the apple which you send is considerably superior in quality to the Twenty Ounce Pippin.* I have heard that the Twenty Ounce Pippin was distributed years ago to some extent in the Upper Mississippi Valley.

Whether the variety is one that has been previously cultivated under name or whether it is a new seedling it is certainly worthy of investigating and testing."

Prof Beach also submitted the following description:

Fruit; large. (Uniformity in size and shape cannot be determined from three specimens but I judge that it is fairly uniform in both.) *Form* rather oblate, and irregular varying from smoothly elliptical to broadly ribbed. *Stem* short, sometimes swollen at point of attachment to the tree. *Cavity* medium to rather large, acuminate, or nearly so, pretty deep, moderately narrow to rather wide, usually somewhat furrowed or wavy, partly or wholly russeted. *Calyx* medium or below, nearly closed; segments medium in length, acute, pubescent. *Basin* medium to rather wide, quite abrupt, moderately deep to deep, nearly smooth or with rather wide obscure furrows.

Skin smooth, rather pale green varying to yellow, washed with red and splashed with carmine. Well colored specimens are wholly overspread with lively red so that the *prevailing color* is red relieved by touches of yellow.

Calyx tube medium, cone-shaped. *Stamens* median.

Core distant, medium, or above, somewhat abaxile; cells symmetrical, partly open; corelines meeting. *Carpels* roundish, mucronate, but slightly emarginate if at all. *Seeds* not numerous, medium or above, brown shading to dark brown, acute, sometimes tufted.

Flesh yellowing, moderately coarse, tender crisp, juicy, sprightly, mild sub-acid, agreeable in flavor and good in quality.

DISCUSSION.

Prof. Sandsten: We have been listening very attentively down here and some one has suggested that if the McIntosh Red had been advertised and written up as nice as this apple has been and if scions of this apple had been distributed, if we would have an apple like the one described, and I do not doubt the veracity of the writer, it certainly would be a great thing for us and I hope that his predictions are true and that we can get some trees of this variety.

Mr. Bingham: I understand him to say that this apple was larger than the McMahan, fully as large as the Northwestern Greening. I would like to ask him why he did not bring some large specimens down with him.

Mr. Reis: I said those varieties grown on old trees. I do not believe you or anyone else here has brought an apple from a tree, either Northwestern Greening or Wolf River, that is over forty years old.

The Secretary: I think there is no question about the quality, there certainly can be no question about the hardness of

this apple. There has been until recently some slight question or doubt as to the identity of the apple. We have hesitated to ask this society to name the apple lest it should finally prove to be one of the older named varieties, but it has been submitted to most of the best judges of apples in the United States and not one of them ever dared to say that it is a named variety. I pronounce it the best apple grown in Wisconsin. I pronounce it as good as the best grown in any other state with possibly one or two exceptions. I know that it is hardy. I traveled nearly forty miles by team to see the tree, I have seen the tree and I have the word of the present owner that the tree is forty years old. It has grown in the sod, it has evidently never been pruned, shows no mark of pruning or spraying or any other care. Now, I care not what the variety is, a variety that will persist as long as that and bear fruit as good under those conditions is worthy of a name. It has been going forty-four years without a name, it is time we name it. I move that we adopt this apple in the fruit list of the Wisconsin State Horticultural Society under the name of "Hanko."

Mr. Menn: Has this apple been kept in cold storage?

Mr. Reis: This apple has not been kept in cold storage, it has been kept in common cellar storage. All the apples on the tree were frozen during the cold spell in October and they were picked while they were still frozen, consequently mellowed up somewhat, and they did not keep as well as usual; other years we have had no trouble in keeping them until March first.

Mr. Toole: I second the motion of the secretary.

Mr. Kellogg: Has it been sent to Washington to be identified?

The Secretary: Twice.

Mr. Reis: It has been sent to the pomologist in Washington twice.

Motion to name the apple the "Hanko" was then put to vote and carried.

Mr. Sperbeck: It seems to me we have an ideal apple there for the farmer. There are a great many farmers who never prune and never spray and if they can get that variety of apple, they can grow it.

Mr. Philips: I make a motion that the apple be put in the Wisconsin list of apples for trial. (Seconded).

Mr. Kellogg: I would like to ask you, Mr. President, what is the object of that motion? There is not a scion to be had nor a tree to be had, what is the use of putting it on for trial?

The President: To get it before the public.

(Motion carried).

CALIFORNIA AS A FRUIT STATE.

GEO. J. KELLOGG, Lake Mills, Wis.

My three years in California, from 1849 to 1852, had always created a desire to return and visit the old gold fields and the fruit orchards in the valleys. This desire was gratified in the winter of 1905-6. Our tickets took us by the Northern Pacific and down the coast through Washington, Oregon and the entire length of California, 1027 miles. We traveled on this trip 7418 miles. January 11th I saw seventy-five plates of premium apples at the Oregon winter meeting at Portland, the finest collection of apples I ever saw. They had been allowed to put on all the perfection of coloring far exceeding the same fruits at the four national exhibitions I had previously attended. One would naturally expect a few apples to eat while passing the whole length of Oregon; with three weeks visiting in that state only one place we found any good apples.

My first three years in California (and I traveled nearly one thousand miles) I found only one patch of wild grapes about the size and quality of the Concord and one field only of at least 100 acres of choke cherries and no other fruits. The Mission grape had obtained some notoriety in some of the valleys, this I did not see.

Since the state has become noted as a fruit state, the grape industry has been over done. Thousands of acres of grapes have been dug up and planted to oranges then to peaches, pears and prunes and yet again these groves have been planted to walnuts. These changes are continuing to the present time. Some seasons are unfavorable to this fruit or that; failure to get cars has caused thousands of car loads of oranges and lemons to rot on the ground and at the packing houses; now the walnut groves are threatened with a serious blight. Apple orchards have been dug up as unprofitable. Mrs. H. M. Huntley informs me that a large apple orchard in Santa Clare was dug up. Orange or fruit orchards of five to ten acres are called "Ranches" formerly the term "Ranche" applied to a "range" of a thousand acres. There is a great deal of unrest. Everybody is wanting to sell, but it is usually at one thousand dollars an acre. I learned of a few instances where persons had bought ten acres and paid for them with one or two crops.

Thousands of "Ranches" are paying big returns, thousands are not paying expenses and large numbers are dying or have been abandoned for want of water. At times they have too

much water. After we visited Fresno the 6th of April, the floods came down from the mountains and covered 25,000 acres with water from one to ten feet deep, washing out orchards and vineyards and doing immense damage.

A friend of mine traded a \$12,000 property in Chicago for a twenty acre "Rancho" ten miles east of San Diego giving a \$5,000 mortgage to balance; with no experience, a shortage of water, interest could not be met. Foreclosure was the result. The man died, his widow now keeps a little country store.

Another cousin next door cultivated ten acres of oranges and ten acres of lemons for eight years and did not make expenses. He had bought a water right for \$900 and then had to pay \$90 a year for the water. Some years this was insufficient and he was compelled to put down a 75 foot well and attach a gasoline engine at a cost of \$1,000. With this double water privilege he expects to make it pay.

Messrs. Clark Bros. bought adjoining him twenty acres each, put on \$20,000 improvements on each place. After running it for years they abandoned both places because they would not pay. Here is a chance for the one dollar "tenderfoot" who comes along. T. J. Bryant's well near Spring Valley is only 75 ft. deep giving plenty of water for twenty acres while only a short distance on the hill at Lemon Grove a well 615 feet gave no water.

Twenty-five acres of oranges near Spring Valley Station owned by an Englishman was mortgaged, sold and is going to ruin. Six hundred acres of lemons at Lemon Grove worked from 8 to 12 years have not generally paid expenses.

I rode through Eagle "Rancho" which cost \$50,000. This brings no profit. I visited the Gen. Grant Plantation costing between thirty and fifty thousand dollars near Mesa Station. This is run at a loss.

Lemon Grove packing houses charge 59½ cents a box for washing, sorting into two grades, drying, curing, packing and selling. At Santa Anna Mr. Bristol sold on the trees 8 acres navals for \$900 and 2 acres Valencia for \$1,000.

Mr. F. Messer sold the product of 1 acre of strawberries for \$700. The strawberry gives a crop from October to December and again in April, May and June.

I visited R. B. Lane's orange grove in Redlands. He pays \$350 a year for water for seventeen acres. He has been at it for many years and he makes it pay. He also has a valuable ten acre lemon grove right in Holly Wood. When it fails to pay in fruit he can cut it up into city lots and realize \$20,000 an acre.

I visited a friend at Fair Oaks, Sacramento county. He has ten acres of oranges, pears, peaches, apples and grapes and ten acres of olives. One year (1904) he succeeded in getting water enough from the water company. Then early and unusual rains came and the oranges puffed up so large they were worthless. This last year the high winds spoiled half his fruit.

At Penyon, east of Sacramento, we visited friends who had put \$12,000 on about twelve acres and would sell at much less. He had often shipped peaches east and had express charges to pay besides losing the fruit.

I did not find a place or man who could sit down on a fruit "Ranche" and coin money. It takes money, brains and muscle to win and often years of experience.

I traveled sixty miles about Los Angeles to look up the strawberry business. I visited acre after acre. Some were picking April 1st half ripe berries, grown without mulch. The plants only had about three or four leaves. Some with low culture, others with high ridges between water ditches 18 to 24 inches below the surface. On one field they were throwing away more defective berries than they saved and asked twenty-five cents for the green berries they were picking up to the 18th of April. I saw no good flavored berries. With this mode of culture and the feeble condition of the plants I cannot see how the industry ever pays. The season of 1905 and 1906 was cold and wet, worse than usual. At Holly Wood, Walter Benedict showed me his books where he had from one and one-half acres of strawberries taken in \$1,800 in one year, selling at 25 cents to 30 cents a basket which holds a little less than 12 ounces. This is the size of the berry basket of southern California. Mr. Benedict had ten acres. Some of it worthless hills but valued at \$35,000.

The four months we were there we did not get a dish of good berries and yet they claim to have strawberries the year round. The 18th of April they were selling at 10 cents a basket.

A person going to California to stay wants at least \$60,000 to start with and a few years experience before investing in anything. Churches are now on a basis of "16 to 1." A Sunday sitting is from one to sixteen dollars each. Preachers get from \$3,000 to \$6,000 a year. Tourists were welcomed in proportion to their pile of gold.

The insect pests I did not find as bad as I expected. Some spray and some do not. Deaths occur among the children from eating poisoned orange culls that are peddled about the streets. These are the culls from the packing-houses. The prices at

retail for good oranges in Los Angeles was just as high as in Wisconsin.

For the fruit industry considering the advantages of soil, seasonable rains and the markets, give me the best orchard sites of Wisconsin rather than California.

As to climate there are many locations in valleys protected from floods that get the sea breezes without the high winds that have plenty of water for irrigation. These choice locations are few and the good land is so scarce that it is held at from one to three thousand dollars an acre. With these conditions and the earthquakes, the rains, mud and winds of winter, the heat, lack of water, dust, drought, winds and fleas of summer you may have its climate and roses. Give me Wisconsin.

DISCUSSION.

Mrs. Treleven: I have heard say that people get so attached to one place that they do not think there is any good in any other place. When I was in California I did not see any of these bad things, I was not looking for them perhaps.

Mr. Bryant: I think it is only fair to the state of California to say that shortly before I left home my father had a letter from an old friend who was one of the early members of the Illinois State Horticultural Society and among other things this gentleman, who is pretty well along in years, stated that they had a twenty-acre ranch, as he called it, devoted to growing oranges and lemons and he made the statement that it was netting them annually an average of ten per cent on \$3,000 per acre, in other words, \$300 per acre per year. He is a man that I know of good veracity and I think we might take his statement.

Mr. Kellogg: I don't question this gentleman's statement; you can tell any story on either side of the question and it is true. My friend, Mr. Fargo, spent a number of winters there and can tell us something about it.

Mr. Fargo: I think I am on the other side of this question from my Brother Kellogg. A friend of mine, Mr. Lane, has an orchard of oranges and lemons at Hollywood and I said to him last winter, "Why don't you sell it off, fifteen acres at \$1,000 an acre, you can get for city lots. And he said, "It is paying me interest on \$75,000 to raise lemons."

Mr. Patten: I have had a little experience in California during three or four winters that I have spent in the state. I

think that Mr. Kellogg's delineation of the condition of California is very truthful. I am free to say that from my observation in that state, and it has been from Los Angeles to seventy-five miles north of San Francisco, all through that region, having friends in Santa Clara valley and all up and down the state, I am free to say that I believe that fruit growing in the state of Wisconsin, in Northern Iowa and Minnesota today is a more reliable industry than it is in the state of California. There are so many conditions there that people who have never been in California with a view of studying them cannot understand.

The whole state is made of washing down of mountains, made, as Mr. Kellogg said, of freshets that come down from one to twenty feet deep and wash the soil out in the valleys and here is a beautiful tract of land, twenty acres laid off here; another twenty acres just along side of it. A man plants a prune orchard here and he has a grand success. It is a magnificent output that he gets from that twenty acres. The other twenty looks just as good, but he has never gone down there with a test auger or anything of that kind to examine the soil, and whereas the wash of the country has left this twenty acre tract with twenty feet deep of the richest kind of soil, the other tract is only three or four feet deep and below is a mass of gravel, some former wash that has come down from the mountains and that man's tract is an utter failure. Where you find one that is a success, you will find plenty that are failures all over California. Referring now to a little work that my son and I did last spring, we planted ten acres of orchards, planting them with summer and fall varieties, and I believe that we will be able to take in the next fifteen years from that ten acres of ground as much clear profit as they will be able to take in from any ten acres of ground of the very best in California and it does not cost five hundred and one thousand dollars an acre either to purchase such land in Wisconsin and Northern Iowa.

THE DOUSMAN HOME FARM SCHOOL.

The President: Gentlemen, we have all of us heard of the Home Farm School which is located at or near Dousman between Madison and Milwaukee. We have with us Mr. Melville, who will give us a little talk upon the aims and objects of that school.

Mr. Melville: Mr. President, we do not raise apples or pears, we do raise a few strawberries, raspberries, currants, and

gooseberries, but we do aim and try to give boys a chance, to give the boy a chance to make a man of himself, to give the boy a chance to develop into a good citizen of the state, to give the boy a chance to grow where he would have a chance to be dwarfed in his present surroundings. For several years it has been noticed that the boys going to Waukesha were partly of a certain class and a few of them of a different class and so the children of the state have been divided into four classes, the children who are normal children, the boy and girl who is cared for by his or her parents and who goes to school; the boy or girl of a certain class of parents who do not seem to be energetic enough to wield a strong influence over the child and make that child something that is fit for school more than half of the time. This class come into the class of misfit children. Then the boy or girl who comes from the surroundings of the streets of our cities and villages, the boy and girl whose environment is such that it leads them into contact with crime, that leads them into contact with those that are criminal, that leads them to become criminals. Then the children of the truly vicious parents, those that are vicious, not only from their heredity but from their surroundings generally. Now, these four classes the state cares for, first in our public schools the state cares for the large proportion of the second in our public schools and the state cares for all of the last in our industrial schools, but where are we going to place these few unfortunates of the second class and all the third class and where are you going to place them? We find these boys everywhere; we do not need to go outside of Madison, we do not need to go outside of the village of five hundred inhabitants to find them. This class, it is evident, cannot be placed among the normal scholars in our schools, they must be cared for in another way. Is it fair to send them to Waukesha, to place them with environment children, place them in contact with the criminals? It is the only place where the state can send them and so under this head a few of the people of the state of Wisconsin are organized as a Wisconsin Home and Farm Association to care for this class of boys, to take them from their environment and take them out in the country, to take them upon a farm, to teach them to work, to give them a common sense education, where the teacher can give them the individual attention that they need, and give them a chance to make something of themselves.

A few years ago last October this Association rented a farm just west of Belleville near a lake. Here those boys, none of them but what was a source of worryment to the principal and dread to the teacher, many of them had been almost verging

upon criminality, five of them we know are self-supporting boys earning their own living upon farms or in offices after being in the school for two years. We hope in this way to make good citizens of the boys that we take into our schools. Where are we going to obtain the boys? We obtain them from a great many sources; we obtain them from truant officers of the cities, we obtain them from probation officers of the cities, we obtain them from private individuals who find a boy is getting a bit bad, put him in a place where he can be cared for, and where he can get help to make a man of himself in this way and we obtain some of them from the courts where the judges claim that it would be a sin against a boy to send him to Waukesha. In this way we have during the three years of our existence cared for about forty boys. Of these, ten boys have gone out into the world to earn a living for themselves. Nine of these boys—remember of this class that we say are criminal and which should be placed in Waukesha or wherever the state says—nine of these boys have proven a success, are at present self-supporting. One boy, weak-minded, under very bad conditions was taken back by his mother to the city and has proven a failure. He got into bad company, he was driven out of the home evenings by the mother, associated with the gang and the gang went bicycle riding one day and borrowed bicycles and the judge thought that the boys should go to Waukesha and learn not to borrow bicycles or anything else. In this way we think we are doing a good work for the boys of the city.

How are we going to succeed with our work? We must depend on the charity of the people of the state. We purchased a farm two years ago and we are paying in small payments for this farm. We started agricultural work and horticultural work. Some of the nurserymen two years ago this coming spring donated to us quantities of raspberries, strawberries, gooseberries and currants and the boys have planted and cared for these. We had a crop of raspberries from our bushes last summer, some strawberry beds have been started, but the strawberries failed to materialize, but we have the boys interested and we are making men of these boys. I say, we are dependent upon the charity of the people of the state, and we wish the people of the state would investigate our work. If they have boys in their vicinity that are bad boys, that are going to be bad, not vicious boys, not criminal boys, but the boy that is more sinned against than sinning, boys that Judge Lindsey says must not be sent to a criminal factory, these boys we are trying to make men of, we mean to help these boys to help themselves. We do not claim we can make a new man; we claim by forma-

tion we can make more out of such a boy than we can by reformation. Now, we are in the market for boys, we have room for them. We are also in the market today and we hope on this farm to put up buildings on which we can put fifteen to sixteen boys under a caretaker who will be called the "House father" and assign them to different cottages on the farm and bring up the boy under good healthful surroundings where they will have good healthful work, where they will have occupation and where they will have instruction and to do this we must have the aid of the people. We hope that this farm, which is in the great strawberry section of the state, we hope to have a farm upon which we can raise strawberries and raspberries; we hope, in fact, to raise a few apples and such things at some time in the future for the boys and we want the help of the State Horticultural Society in starting in this work. We want their aid in this, we want their aid also in building new buildings, but we find we want the aid of all the people of the state in stocking our farm and building it up and placing it in condition in which we can have these things. When a boy comes to our school, the first thing we find about him is that he has learned this lesson, from whom we do not know, "The world owes me a living," and we must teach that boy that the world owes him a living if he earns it. He must give us work every day to sustain himself, he must give his work to show that he is earning what he is getting from the school and what he is to get from the world and it is the great lesson which we have to teach them. What do the little boys do? Well, the little boys do a great many things. The boys plant and care for strawberries and raspberries and currants, they plant gardens and care for onions and peas and beets and so on. They pick them, they box them they prepare them for shipment to market, they do everything of this kind. They work upon the farm in other capacities; learn to handle a team and work in the harvest field, learn to shock oats and care for them. They learn to care for cows and horses and sheep and hogs and they learn above all other things that there is something to do for them in the country and there is a place for them where they do not have the gang to annoy them and you will find these boys even if they do go back to the city say that they wish they could go to the farm again where they can be free, where they can live as they want to live and where they will be free from the gang. We ask you to give us all the individual assistance that you can. There is another phase which may interest the ladies. We teach the boys and girls to do housework; we teach our boys there to be girls, let us say, the boys wash dishes, they scrub floors, they prepare

vegetables for cooking, in fact they do everything that a girl should do to help her mother and they do it willingly, being placed off in sections, some of them excelling even in this work and if you want to know why we do it and want to know what good it will do them, as a lady asked me, I said it was good for them and the only reason I could give was that if the fellow ever married, he would learn to sympathize with his wife.

The President: Before we adjourn, I would say that this is a very worthy enterprise. A good citizen is worth a great deal of money and if we can help to make good citizens, we are helping the state to become richer, and the nation. I am sure that any assistance that we can give this institution will be gratefully received.

FORESTRY CONDITIONS IN WISCONSIN.

E. M. GRIFFITH, State Forester.

Mr. Griffith: My subject was assigned me "Forestry Conditions in Wisconsin," but, as you all know, forestry work in Wisconsin is rather new, and so in the few minutes that I will speak before I commence with the slides, I am going to explain something about the whole forestry movement in this country, with your permission, as in that way you will get an idea of what has been leading up to it in this state.

In the first place, I want to emphasize what forestry is. A great many people have the idea that it is associated with landscape gardening. It is not at all. Forestry is the conservative management of forests so as to secure successive crops of timber, the idea being to cut conservatively and so always have something to cut, in other words, treating the forest as if it is a crop, as it is, instead of cutting it all at one time and thereby destroying it.

You probably know that forestry is a very old profession abroad; it has been practiced there for hundreds of years. If you travel in Germany, France, Russia, England, if you go to India, if you go to Japan, you will find the forests carefully managed both by the government and by individual owners. All these countries have realized that there is a certain part of their country which is suitable for agriculture and another part of it which is only suitable for the growth of trees, and they know very well that if the forests are destroyed that the watersheds of the country very soon cease to be protected. You will

find that condition in India, you find it in China, as I will point out to you later, you can see for yourselves as the slides are shown on the screen.

Forestry in this country has only been practiced for about ten years. It was first started by the national government under the administration of President Cleveland and he commenced by setting aside, that is, withdrawing government lands in the west, notably in the Rocky Mountains and the Sierras and setting those aside as forest reserves. There was a storm of protest in the west from the lumbermen, cattlemen and miners, because they did not understand what the movement was, because they thought forest reserves simply meant parks where people could amuse themselves, where eastern men could go to hunt. The opposition was so strong that congress at one time abolished the reserves, but they were again created by Cleveland, who established more; McKinley kept up the work and Roosevelt has pushed it very strenuously, as he does all things. It is interesting to foresters to see how public opinion has swung around; instead of there being opposition, it is amusing to see how the miners and cattle owners of the west are petitioning the government from time to time to add more land to the forest reservations, particularly the ranchers, because they find the protection of those forest means that they will have water in the low land that can be used for irrigation.

I want to touch upon a tremendous work that the government is doing in the west, that is, in irrigation, which should certainly interest this Society, because it means, as the Geological Survey promises, that the land between the Mississippi and the Rocky Mountains will support double the population that is living there at the present time. As the geologists look over the land that can be irrigated, thousands of acres of land which now is only supporting sage brush and cactus, they find that much of it can be irrigated from the great rivers, and you, gentlemen, would be astounded to see the productiveness of that land as soon as irrigation is applied. The orchards on those lands are the most magnificent I have ever seen, but what the Geographical Survey of course particularly appreciates is that the first thing they must be assured of is a permanent supply of water, so they have worked hand in hand with the forest service and they have asked the President to set aside such lands as will further these projects of irrigation. It is a tremendous work that is being done there in the west. I just received an announcement from Washington today giving the areas of the forest reserves as they are being increased every month. I see that last month they were increased by over a million acres.

Today there are 128,000,000 acres of forest reserves in the United States. The work is on a tremendous scale. Ten years ago I do not suppose there were to exceed twenty foresters in this country, now the Forest Service has over 3,000 trained men on the forest reserves and the forester is clamoring for more men all the time; to properly man those reserves they would need 20,000 men and the receipts are simply astonishing. They have said to congress, "If you allow us to manage those reserves as they should be managed to get them in proper shape, we will promise in four years we will not ask for any appropriation." And the promise is going to be fulfilled. It was upon the invitation of the people of the west that the open ranges were all put under the Forest Service, so that the Forest Service can rent, lease and take charge of the open range for the government. The use of the timber, the protection of the stream and also the agricultural land within the forest reserves, all go together.

To pass rapidly from what the government has done to what the states have done,—New York state has been most active in forest work. We all know that there is a tremendous demand in New York that something be done to stop the cutting of timber around the head waters of the Hudson river; it came from the captains of boats on the Hudson river who found they could not navigate the river because the water was getting so low and they asked the state to forbid the cutting of timber within ten rods of the banks of the river. The legislature looked into the matter, and they said that that would not cure the evil, that they must go to work and purchase land and create a large reserve. New York was not so fortunate as Wisconsin in that all state lands had been sold and lands which they had sold at about twenty-five cents an acre they were glad to buy back and were very fortunate to get at three dollars, so that today New York has a forest reserve of one and a half million acres and the people are clamoring to have the whole Adirondack region purchased. Pennsylvania comes next with a reservation of 700,000 acres and Wisconsin now ranks third in area, we have in our forest reserves 274,000 acres. The state of Michigan has 40,000 acres and Minnesota about the same amount, including her large parks, which are really forest reserves. As President Roosevelt has said to congress, it is the biggest problem before this nation today, there is no use in dodging the issue, there is going to be a timber famine in this country, we cannot help it because we are cutting far and away in excess of the amount that is grown. They figure today that there are two hundred billion feet of timber standing in the



Cattle feeding on young sprouts in a wood lot.
Illustrating "Forestry," by E. M. Griffith. This and following
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Forest Service, Washington, D. C.

country and our rate of consumption is such that within fifty years practically the supply will be gone. The amount of cutting is not so bad as the amount that is destroyed annually by forest fires. That is the tremendous thing. I want to read just a word that President Roosevelt said in one of his latest messages to congress on this subject:

"You all know, and especially those of you from the west, the individual whose idea of developing the country is to cut every stick of timber off of it and then leave a barren desert for the homemaker who comes in after him. That man is a curse and not a blessing to the country. The prop of the country must be the business man who intends so to run his business that it will be profitable for his children after him. That is the type of business that it is worth while to develop. The time of indifference and misunderstanding has gone by. If the present rate of forest destruction is allowed to go on with nothing to offset it, a timber famine in the near future is inevitable. Fire, wasteful and destructive forms of lumbering and the legitimate use taken together are destroying our forest resources far more rapidly than they are being replaced. It is difficult to imagine what such a timber famine would mean to our resources and the period of recovery from the injuries which a timber famine would entail would be measured by the slow growth of the trees themselves. You have got to act in time or else the Nation would have to submit to prolonged suffering after it had become too late for forethought to avail."

The two points I want to call your attention to in this,—because President Roosevelt, as you know, is so remarkable for hitting the nail on the head in nearly every subject he takes up, and he does know forestry because he knows the west and he appreciates the need for it—there are two points he has emphasized very well. One is that after the timber famine has come you have to wait for the slow growth of the trees themselves before you can rectify the mistake. When you come to think, it is about the only great resource we have that is in our own hands to manage, or mismanage, as we please. When we take out the coal, that is expendable, we cannot make any more coal; when we take out the oil, we cannot make any more oil, and the same with iron and gold and silver, but we can manage our forests so that we can always have a supply of timber. And the second point is, that terrible destruction that is left by lumbering and which means a barren desert for the homemaker that comes after, that is a thing that you from the northern part of the state will, I am sure, appreciate.

In Wisconsin the forestry movement commenced in 1903.

The legislature passed a bill providing that all the state lands should be set aside as a forest reserve and afterwards in committee they tried to better it with a bill providing for the sale of the lands and it got badly mixed, so that it provided both that the lands should be in the forest reserve and sold at the same time, so that the attorney general and others said that the best thing to do was to pass another bill at the next session of the legislature, and at the last session in 1905 we introduced a bill and the legislature passed it and it has been pronounced the best forestry bill in the United States, and it ought to be, because we had the experience of other states to guide us. The legislature was extremely generous to us, they gave us all the land which the state owns north of town 33 and provided that it should be in the forest reserve; that amounts to 254,000 acres and at the last session of congress the federal government granted us 20,000 acres to be added to the forest reserve. The provisions in our state forestry bill are broad. In the first place, one of the underlying principles of forestry is that you must not take any lands for forest that are suitable for agriculture. The reason for that is that in any country and state there is land that is only suitable for forest and not for agriculture. A good many land agents will tell you that it is not so, that a whole state and county is a perfect garden of Eden and that the whole state is fit for agriculture. I only wish that was so, but we have not found that so in our experience. The forestry bill provides that we may sell agricultural or scattered lands and that the proceeds shall go into the forestry fund and the money expended for more lands. We have now in Oneida county a fairly solid patch of 100,000 acres and we hope to add to it until we can get to the point where we will protect the flow of the Wisconsin river and also largely the Chippewa on account of the two branches of the Flambeau river that head up into that forest reserve, because that is the main reason for forestry work in this state. You all know what a wonderful lumbering state Wisconsin was. You know what a magnificent stretch of forest we had through the northern part of the state and you know the wealth that came to the lumbermen and the reason they became so wealthy, more than in many other states was because they had this magnificent net work of rivers on which to float their logs; it was child's play compared with the work in some of the eastern states. Now, that network of rivers means that Wisconsin has magnificent water powers and as the lumber disappears, the state will go to manufacturing. Last year the geological survey found over 100,000 available horse power between the dam at Kilbourn and Grandfather



Two freshly turned furrows completely checked progress of the surface fire.

Rapids. That is on one river, but this river, our great river of the Wisconsin, will not be very valuable for manufacturing plants unless we can assure the men that come in and build mills that the flow will be uniform and that is what the forests do, they act as a great sponge in holding the moisture and giving it off gradually.

You have often heard the claim made that forests affect climate, that they bring on rainfall. That is one of the very rare things forests will do under extreme conditions. I have seen myself, in arid plains, under extreme heat, where it was too dry and hot for a drop to fall, but when the clouds got over the cooling forests, they would drop their moisture. In Wisconsin, surrounded as we are by great lakes, I think that the influence of the forest in that regard is so small that it may be left out of consideration. But here is the important point. In the spring you will find the snow banks hanging on in the woods after they have long since disappeared in the open field and the water, is soaked into the humus, and works down gradually through the surface and is carried off in underground streams, so that you will find the streams in forests are uniform throughout the year but streams which arise in cut-over countrys are subject to terrible, violent floods after heavy rains or snows and sink to a mere trickle in the summer months, and of course it is important to manufacturers that the flow be uniform. That is the main object of forest reserves in Wisconsin. It is to protect the headwaters of our important streams, and, second, to insure a supply of raw material to those people who are going to use those water powers. People have said, "Why don't you take the money and buy hardwood lands?" and I say, "Hardwood land is on areas where there is good soil and that ought to be used for agriculture and the hardwood areas are not on the watersheds of important rivers and as we want to preserve the uniform flow of rivers we take the land that is cut over and unsuitable for agriculture." We have as I said, three forest reserves, one on the headwaters of the Wisconsin and Chippewa, another along the St. Croix river in Burnett and Douglas counties and a third, which will also be a public park, on the Brule river in Douglas county. I do not know if any of you know the Brule river, but it is considered one of the most beautiful streams in the state and there we expect to have a fine forest reserve and park. I can show you the different features of forestry as we go along with the slides.

SLIDES.

This photograph was taken in Germany, in the Black Forest; you will notice how closely the trees stand. This forest has been brought into that fine condition by careful cutting and as you all know if trees are obliged to grow densely, they must shoot up without forming side branches, consequently, if you keep the timber crowded, you get long, clear, straight logs. You see that exemplified here, because the trees that are getting side light are branched out. If the light strikes dormant buds on the trees, they will develop.

I put in here a few slides showing you the typical forests as they formerly existed in Northern Wisconsin. This is an example of a virgin white pine forest such as formerly covered the northern counties of our state, but has now become so scarce that a number of gentlemen have requested us to keep a small area of forest like that so that people in fifteen years to come could see what a good big white pine looked like. The rise in stumpage values in Wisconsin has been perfectly enormous and that has led to much more careful cutting in the present than it used to be. An enormous amount was left in those days which would be taken today and the slash which was left caused such severe forest fires that everything was destroyed.

This is the Norway pine of Wisconsin and it is very seldom today that we see long, clear, beautiful trees like this. Those were grown under the crowded conditions and that accounts for their shape.

Here we have the hemlock forest, which is playing so important a part in the state. The white pine is only valuable for its lumber, but the hemlock is not only valuable for its lumber, it is extremely valuable for its paper pulp and also its bark is important in tanning. The supply of hemlock in Wisconsin is very limited and therefore there is all the more necessity that the supply shall be carefully handled, because, in the future, if our paper mills do not have hemlock, it is very difficult to know what they are going to turn to.

The hardwood forests have been operated in only very heavily during the last few years. We have sections in the state in Oconto county, in Forest county and in Polke county, where we have magnificent stretches of the hardwood forest just the same as you see here. These forests are fairly well protected from forest fires as compared to the coniferous forests which have already been destroyed.

This shows the last class of timber in Wisconsin to be oper-

ated upon very heavily—the much despised jack pine of a few years ago. It is now being cut by some mills and put in with white pine, but I think its value in the future is going to lie very largely for fence posts and particularly for ties. The railroads in the country are finding that the tie supply is one of the most important things which they have to face and in order to help out their supply they are beginning to treat their ties with creosote and with zinc chloride or sulphate treatment. They find that these very porous sappy pines make the best ties of all on account of their pores, because the treatment goes right through them and consequently they will last much longer than a very valuable white pine. You may have read in the papers that a good many railroads are now planting their tie timber; the Pennsylvania road is planting thousands of acres; Dean Henry told me just lately he had been on a trip to the East and as he went along the Pennsylvania road and saw those large tracts planted, he thought they were large orchards, but they are not, they are trees which the Pennsylvania are planting, looking to the future for their supply of ties.

Any of you who have been up in the lumbering region know what a slash is, that is the tops of trees which are left after lumbering operations, lying on the ground in the sun, they become thoroughly dried out and when a fire starts it destroys practically everything that is on the ground.

Here in the foreground is a large amount of slash and the lumber company operating on this tract had stopped right at this point, meaning to save this forest and cut it more conservatively, but they did not dispose of their slash and you will see the result on the following slide.

This shows the ground taken at a close distance after the fire had run through. It killed everything and the standing dead trees were finally blown over and will furnish fuel for another fire.

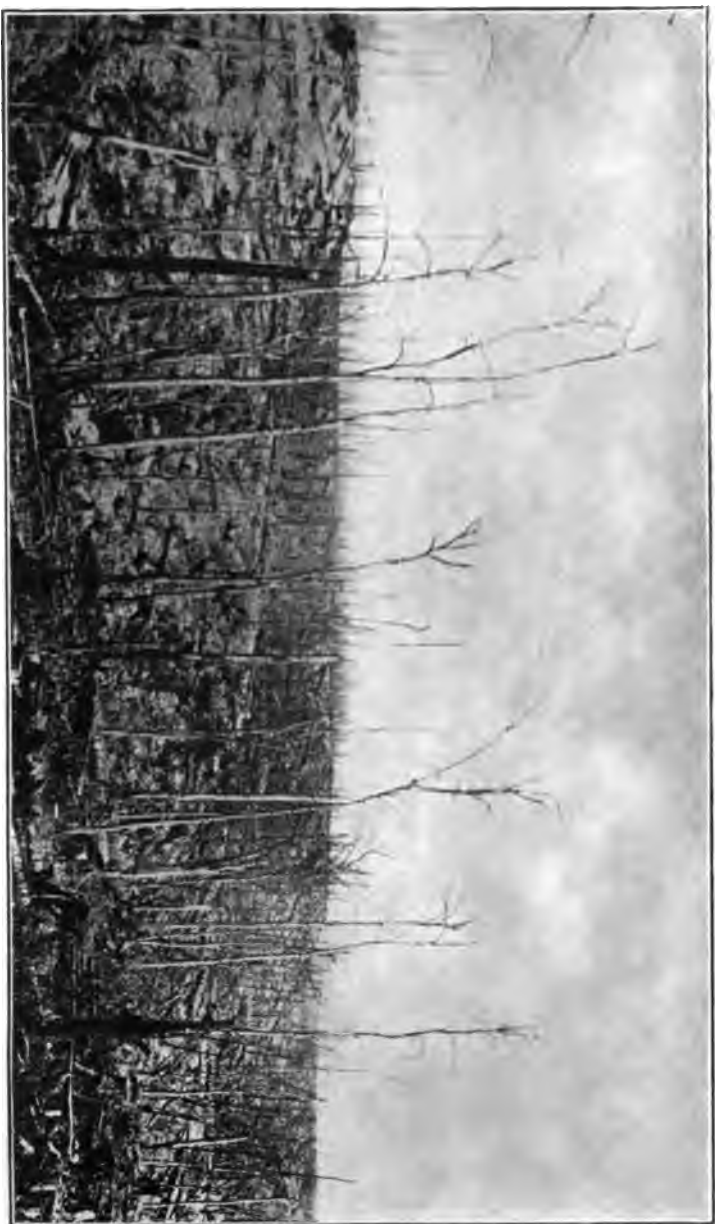
This is what the President means by what the lumberman leaves for the homemaker. You see here land that has been repeatedly logged over and then burned. You can see the dead trees which eventually will be blown down and furnish fuel for future fires and those fires have been so severe that they have destroyed all the humus on the soil, and the humus is the most important thing, because it is the thing that the farmer could depend on as being the rich top soil and a fertilizer, and it has been burned, as you can see in the picture, right down to the white sand. There are millions of acres in this state and in Michigan and Minnesota which have been left in just that condition and it is an extremely serious question, not only for

the counties in which they lie, but for the whole state as to what shall be done with it. The tendency of course for a land company that has cut-over lands which have been left in that condition is to try to settle them, but it is extremely important for the state that they should guide settlement upon lands where the settlers can have some hopes of being fairly successful, and it is not fair to take a man and put him on a tract where it is almost impossible for him to succeed. Now, there is good sand and poor sand, but where those sandy lands have been burned over repeatedly, time after time, there is very little if any fertility left in the soil. Such lands should be permanently held under forest and replanted and the sooner replanted the better it will be for everybody concerned.

This picture shows you how a tract has been left after it has been lumbered under forestry regulations. The definition of forestry is conservative lumbering, it is lumbering the tract so that you will have successive crops of timber and the forester comes in and takes out the mature timber, he harvests the crop that is ready to be harvested and leaves the young tree growth. You see the young growth has been left in good condition and here is the slash pile cut and ready to be burned. That was done by a company under the direction of the government.

In many cases, due to contracts or for other reasons, we can not oblige such a large amount of timber to be left, and as you know, if they were allowed to do so, most men in cutting would take everything. This is a picture taken on one of the Indian reservations in Wisconsin. The State Board of Forestry is co-operating with the Forestry Department in Washington to see that there will be some forests left in the future, in other words, to stop the slaughter of timber and the terrible fires. Those contracts were signed years ago, we can not oblige them to leave much timber, but we can oblige them to leave seed trees, so we go in and mark the trees which shall be left and in the foreground you can see the slash pile to be burned, making it impossible for those terrible fires to go through.

Wisconsin would have passed such a law many times if the lumbermen had not defeated such laws in the legislature—I am not blaming the lumbermen for everything, possibly business conditions demanded it to a large extent, but they often blame the state for not having enforced the rules, but the lumbermen came to Madison and to St. Paul and they defeated those bills in the legislature, but if they had been compelled to burn their slash, the fires which swept over the forests would have been impossible and the trees which were left would have seeded the ground.



"The desert which is left for the homemaker." Lumbered and burned over.

Here is a case of natural reproduction, thousands and thousands of young pine coming up. You have heard the statement that pine will not follow pine, that is absurd, pine will always follow pine if we do not let a fire in and destroy everything.

This picture was taken in the Black Hills, South Dakota, and you see the hills covered with young pine; the mature timber had all been destroyed by the mining companies, but back on the hills there were a few large pines left, and they carried seed until as you see, miles and miles of the young pine coming up. The pine cone opens during the heat of the day and may be open one day when the wind is in one direction and may be open again when the wind is in another direction, so that the seed is carried in all directions.

There are large areas which have been so cut and burned over that there is no hope of any natural growth coming up that amounts to anything and consequently we must go in and plant. That is being done very extensively all over the country. This is a view of a large government nursery in Kansas where, as far as man knows, they have never had a forest. They keep the pine in nursery beds until they are two years old and then they are transplanted. This shows you the trees as they are set out, they set them out as a rule twelve hundred to the acre. The cost, everything included, will not exceed \$3.50 to \$5.00 an acre, according to the region and species used, but I am talking of white pine and Norway pine, it appeals strongly to the government, because they are looking far into the future.

This is a plantation of white pine owned by an individual in Massachusetts. The white pine in Massachusetts is very valuable and the pine they are cutting is about this size and it is all going into box boards, they find it extremely profitable.

A feature of forest reserves that I have not spoken of at all is the great outdoor place that it will be for the people, not only of this state, but of the whole Mississippi valley. I told you that in the Adirondack region of New York they have a million and a half acres and as it is extremely popular the people of New York City go there for the summer, camping, fishing and hunting. They have hotels and boarding houses in the Adirondack region, 29,000 I think the figure is, and in 1905 193,000 people went there for pleasure and recreation. The receipts in New Hampshire one year from the summer tourist business were over \$10,000,000. In Northern Wisconsin we have a lake region which is second, I do not think, to any in this country. We have in three or four counties in the northern part of the state over 1,200 lakes, magnificent lakes, and one great feature

of the forest movement will be to protect those beautiful lakes so that people can go to that region for rest and recreation.

This shows you what Minnesota is doing. You all know how desolate a lake is around which the timber has been felled, where the tops are lying and dead timber all around the edge, and so Minnesota is trying to keep at least a fringe of timber all around the lakes and we shall try to do the same thing in Northern Wisconsin. Where we have not money to buy land around the lakes, we can at least negotiate with the lumber companies to leave a fringe of timber.

These last two slides that I showed you I wish to say something on as to the matter of forestry applied to farm wood lots. The farmers of the country have only lately begun to realize how important a part of the farm the wood lot is, how much it means to them to handle their wood lot carefully, especially in the last few years when the rise in stumpage prices has been so rapid and extraordinary. Many men do not seem to stop to realize that a good tree takes up no more room in a wood lot than a poor one and the first thing they usually do, instead of going in and cutting out the dead and dying trees and then the crooked trees, they take out some of the live trees. The wood lot should be left in the very best growing condition, to make it produce as much as possible, just as you do any other crop. Here, for instance, is a wood lot that we managed in the northern part of New York state and the farmer that owned it wanted to reproduce to chestnut, so we left the large chestnut to reproduce and brought the whole wood lot into what we call an even aged condition, we cut down so that we get trees about the same size, or as near the same as we can, then they will all close up, and you will get a stand of trees similar to what we see in Germany. The question of wood lots in Northern Wisconsin to a farmer is important, because, as you appreciate, the farmers of Northern Wisconsin are in many cases quite as much lumbermen as they are farmers. I referred to the matter of forest fires a little while ago, my assistant has just been out attending the Farmers' Institutes, and he tells me one of the things that the farmers were most interested in was just that question of forest fires and he said it led to very heated discussions in many cases.

In the State Board of Forestry we have the appointment of fire wardens all over the state. In any town where we think it important we appoint fire wardens who serve only in their own towns, get no salary, are only paid for the time during which they post notices and fight fire and are paid by the town in which they are appointed. They send in reports after each



Grown in the open and so limby and of little value.

fire and also an annual report, giving the number of fires and telling what the causes were. In the last three years we have compiled all those figures and we find that from 68 to 76 per cent. of all the fires in this state were caused by settlers burning brush and clearing land, report after report would come in, reporting so many acres, sometimes a thousand acres burned over, no damage done, young growth, that was all. Largely through the increased value of timber the last few years, the farmers have begun to realize that there is some damage to them from the loss of that young growth, that it is extremely important, and consequently in these Farmers' Institutes any farmers that were known to be careless about fires were held up and given a good rating, because that of course is a thing which should be punished very severely, that is, where a man is needlessly careless about burning brush and burning slash and letting the fire get away from him.

That slide shows you what that wood lot looked like a few years after the big timber had been cut out. You see it is beginning to close up, in other words, we are getting it into an even aged condition. You see that more strikingly shown in this picture; all the trees are of a more or less uniform size and consequently you will get clearer timber, the timber makes a greater yield and greater returns on the capital.

You will often hear people say that the cut over and burned land is of no value, that it is simply a stand of poplar and aspen. You will find in many cases that pine is springing up within them. In this picture it shows a number of young pine trees showing up between poplar. This represents the character of many wood lots. In the first place, the timber is grown in the open, consequently nothing but limbs, limbs mean knots, and inferior lumber. The grass is growing all through that wood lot and therefore the farmer is strongly tempted to graze his cattle, and, gentlemen, you cannot have a good wood lot and graze cattle at the same time. At least you must exclude your cattle until the trees are above the height of cattle but if you want to get the greatest returns from your wood lot you must absolutely exclude all cattle.

Here is a case of another wood lot. You can see a large amount of young growth, but through the forest are big, mature trees. A tree which has reached this size is mature anyway, the growth has come to be so slow that it is not yielding a return on the capital such as it ought to. You can figure that out with any growth of timber, you can find out when the rate of growth has culminated and the time you ought to cut. When

you leave a tree of that size it is suppressing and keeping back the growth of ten to twelve others.

This shows a point which the farmers are beginning to appreciate, the enormous damage that is done by surface fires. This shows the effect of a surface fire that has burned through the wood lot and destroyed all the humus, taken away the fertility which it has taken one hundred years to put there and it has just burned enough to kill all those trees and the consequence is that the whole wood lot must be cut or else it will blow down and simply lie on the ground, an enormous mass of timber waiting for successive fires.

This is the sort of thing that makes a forester heartsick. That is where on a wood lot there is a fine young growth that has started up and then a surface fire from some adjoining land where a slash is left burns all that young growth which perhaps it has taken ten to fifteen years to establish, and when you burn timber of that sort you have nothing left to produce seed and when that is gone there is nothing left except to go in and plant artificially.

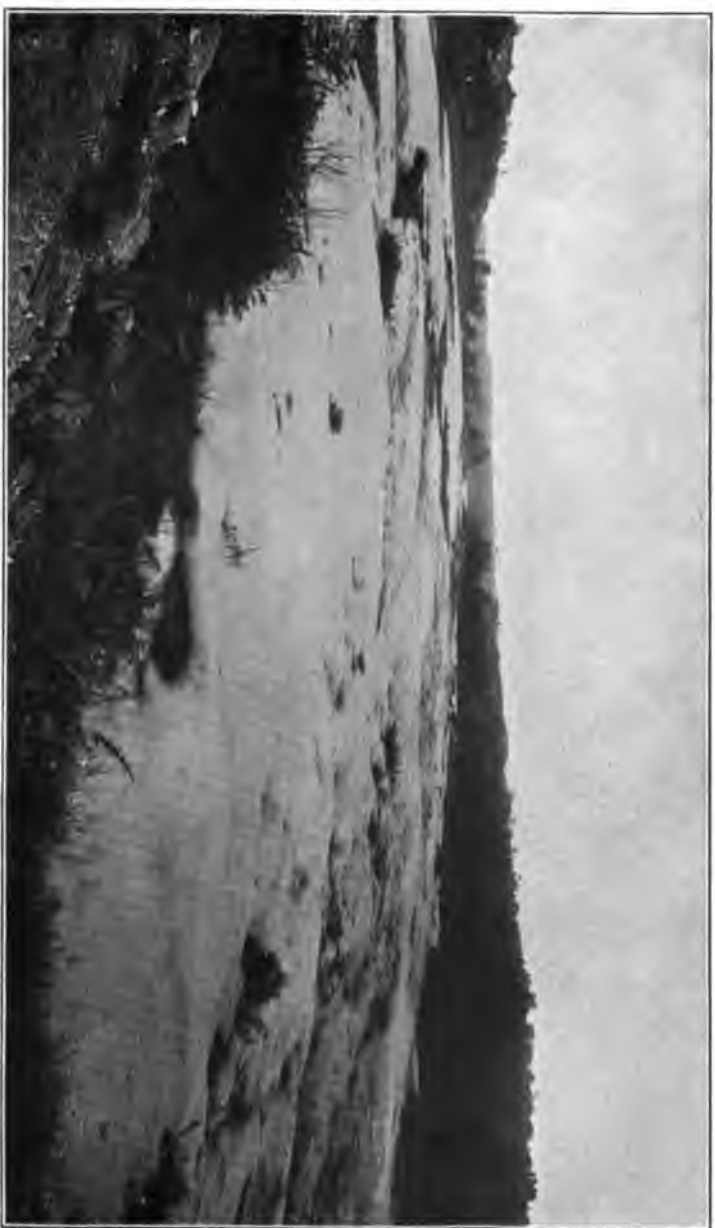
Here you see what the Agricultural Department tells me has occurred over a million acres in this state along the Mississippi river, that is where land has been so washed and gullied that it has been rendered unfit for cultivation. I heard a gentleman make a statement yesterday that struck me as very true, he said the counties along the Mississippi were paying greater taxes to the Mississippi than they were to the state, and county, and I believe that is true, in the large amount of soil that is washed in annually.

The result of such cutting of the steep slopes and erosion is sure to be seen on the lower reaches of the river. Here you see a river which has begun to overflow its banks and cover agricultural land with silt.

And here we have where that river after a year or two more of cuttings is leaving its banks more and more and is covering acres and acres and rendering land unfit for cultivation.

Here you see agricultural land entirely buried under sand. After a big snow on the headwaters, heavy rains coming on, the snow has been melting very rapidly in the early spring, it comes down with a rush, all the sand is washed into the river, the river leaves its banks and creates this tremendous damage all over the country.

Those pictures I showed you were taken in North Carolina, where cutting has been going on very heavily and where you may have noticed congress is now asked to purchase a large



Sand deposited on agricultural land by spring floods.

forest reserve in the Appalachian mountains. On account of the erosion the farmers are driven to cultivate on terraces so as to avoid erosion.

The following views I will show you are from China and you will see erosion carried to the extreme extent. Here you see the native pine similar to our *pinus ponderosa* which formerly grew all over China; now the forests of Northern China have been absolutely destroyed and you will see the results in the slides. This picture I put in to show the extremes to which Chinamen are driven on account of scarcity of timber. As you know, in China it is considered absolutely important that one's relatives, especially one's parents, be given as fine a burial as the funds of the family will permit, and they believe that they must always bury them in a good, substantial coffin. These men have gone a three-days' march way up into the mountains to find trees large enough from which they could whipsaw beards large enough to make coffins and they are now carrying them on their backs.

Here is a view which shows you more clearly what I have been talking about. This is a bed of a river rising in the mountains which has been stripped of all its timber. This view is taken in the summer months and you can see the bed of the river is absolutely dry, but you notice the high banks and you see the large rocks deposited, which will give you an idea of the terrible freshets which come down in the early months.

This shows you a scene in the foothills stripped of their forests; here is the valley of the river, just now a dry bed and the Chinese towns have a wall thirty to forty feet high to keep out the spring floods.

The Chinamen make the best of a very bad situation. This view is also taken in the bed of the river. He knows that the terrible freshet coming down in the spring is bringing all the best soil from the up-country and a great deal of that will settle there and consequently he takes rocks and builds little compounds which will hold that mud and when it settles down he has a little soil to cultivate during the coming summer.

The Chinamen are driven to what the Southern farmers are doing; they are building terraces on some of the land to cultivate on. They will go down into the valleys where they have a deep well sunken and they will carry up the water in two pails on a yoke and they will put it on with a dipper. That is common all over China and India, and I was tremendously impressed with the fact that the terrible famines of China and India are properly attributed to the destruction of the forest, because, as you know they are both agricultural countries with

an enormous territory dependent to a great extent upon irrigation and when the forests have been destroyed there is no water in the streams in the summer months when they need it more directly.

Mr. Griffith then spoke in behalf of the movement of setting aside the region around Devil's Lake for a state park and forest reserve.

A PROSE POEM OF THE FOREST.

ALLETTA F. DEAN, Ph. M.

A twilight hour—

A cloudless sky of opal tints, pink and green and blue; against it the lofty pines slowly and majestically swaying in the gentle western wind. Here below, the sun is set, and yet up there a hundred feet and more, its light surrounds the tree-tops with a dim and tender halo. In its rays the Norway pines show faintly yellow; the white pines richer, deeper red. Near by, a spruce, not aspiring so high, makes delicate faint tracery against the tender brightness; the cedars, lower yet, dark and solid in the twilight, fill in the backgrounds.

These lovely pines! These great, grand, glorious pines! With ever-changing expression each more beautiful than the last. Their shafts rise clear, clean, tapering, to the lowest branches, which are forty, fifty, even sixty feet from the ground; those branches clothed with soft feathery needles. The Norways are somewhat stiff and angular in branch and leaf, but the beauty of the mast-like trunk in its red-brown covering compensates for the angular top. Norway or white pine, the fitting crowns are the clusters of cones that, so far up, look like great amber beads.

You should see these trees at midnight when the full moon silvers them with its white radiance. You should see them at early morn after a night of "frost shower," when the feathery snow has fallen so gently upon them from the cloudless sky, that not a flake has lost its bal-



**Wild grape strangling a Scotch pine.
University grounds, Madison.**



**Young white pine coming up on burned-over land.
Illustrating "Forestry," by E. M. Griffith.**

ance, but lies lightly in little soft fleecy balls and mounds on every twig and cone.

And he whose ear is attuned, can catch the music of these woods even when no breath of air seems stirring. That low murmur seems like the sound of quiet waves upon a sheltered shore. Now comes a breath of wind; you hear the waves rush fiercely up the sands. The wind increases. Once more look at the trees. Great giants they are now, chained down to earth. They strive to break their bonds, and as they struggle, groan and cry aloud!

Another twilight hour—

The massive clouds have all day long obscured the sun; the dense and somber grayness has never for a moment yielded. Now comes the sunset hour, and suddenly yonder loftiest pine is tipped with vivid crimson. All else bears the deep gloom of twilight and dark clouds. Soon a lower top catches the color—and then one after another the tops of all the tallest trees blaze forth in crimson glory. What is it? Are the the spirits of the woods dipping their great torches in the sun's sacred flame and holding them aloft? No earthly fire could so color them. Look toward the west—screened from us by the dense cloud mass no light do we see, no sign of the glory reflected so far above. Rise! Rise! We are too near the earth! Only from the heights can the source of that glory be seen!

Oh! the futility of words! Nature opens to us her glories, then strikes us dumb that we may not tell.

No poet could interpret, no artist could picture the beauty of the soul of these woods.

SOME THINGS ABOUT GRAPES.

C. H. TRUE, Edgewood, Iowa.

Fortunately my topic does not require me to tell all about grapes, but simply some things. Neither does it confine me to any particular phase of the question to be considered; not-

withstanding I should like to treat the subject in a way that will prove most beneficial to those interested. Doubtless I should not have been invited to present this subject before your society had not your secretary considered the matter of grape culture one of special importance to the fruit growers and fruit lovers of your favored state.

Of the very many things that might be said I wish only to speak of a few of the really essential things pertaining to the culture of the wonderful vine whose most wholesome products have blessed all ages of the home and family and whose rich green foliage and clusters of luscious fruit doubtless adorned and beautified the paradise home of the first man, and whose fragrant aroma perfumed the air of the rich valley of Eschol in the long years ago. In his correspondence Mr. Cranefield suggested that you might not be especially particular about the exact cultural directions but rather most likely would like to know something about the practicability of growing grapes in Wisconsin, and also what varieties would be likely to succeed best, together with the nature of soil and site best adapted to its successful cultivation, with named varieties for family uses and commercial purposes, and so in writing this article I have endeavored to make these things most prominent. While not fully acquainted with the general nature of the soils of your state I can think of no reason why some of our grapes should not be successfully and most profitably grown in many if not all parts of Wisconsin. I think there are few plants that more readily adapt themselves to the varied conditions and soils than does the common grape vine, and yet of course there are certain conditions that prove especially favorable to its growth and fruitfulness, this also being true with all other plants and trees. More than twenty-five years ago I had very good success in growing grapes on the deep black corn lands of west central Illinois, and have also met with equally good results on the heavy yellow clay soils of northern Iowa's rolling hills and we do know that some of the finest grapes grown in the grape belts of Michigan and western New York are produced upon soils that are made up principally of sand. An Ohio grape grower informed me that his choicest grapes were grown in heavy yellow clay land that had received little or no fertilizing element for years. On such a soil as would scarcely yield a paying crop of anything else at McGregor, Iowa, on the western terraced bluffs of the Mississippi, Mr. A. F. Hoper, a veteran vineyardist, once grew as fine specimens of many varieties of grapes as I have ever seen produced under any conditions. At the Minnesota State Horticultural Society convention in December we witnessed a fine dis-



Niagara grape planted two years, showing crop in 1906. Antigo, Wis.



Spraying outfit of Edw. Hutchins, Fennville. Mich.

play of perhaps more than half a dozen different sorts of grapes as gathered from the vines fresh and in a good state of preservation and having been grown as I believe by some Minnesota horticulturist; and thus we see over what a wide territory and diversified soils the vine flourishes. In view of which fact were I a resident of almost any part of southern Wisconsin, to say the least, I should not hesitate to plant for home uses or extensively for commercial purposes a number of our best known and well tried grapes with the assurance that it would prove a safe venture. I may speak of one condition under which the cultivation of grapes will not prove profitable and that is on a continuously wet, cold or seepy soil. On the other hand on account of its long deep penetrating roots it will withstand droughty conditions to a greater degree and still thrive than almost any other plant. The finest and sweetest grapes I ever grew were produced the memorable year of 1899 while the growth of the vine was not as much as in other seasons, the maturity and ripening of the fruit was most perfect. While the grapes will thrive and fruit heavily on moderately rich soils, should they contain an excess of nitrogenous matter, mildew and scab is likely to appear and for this reason the liberal use of fresh barn yard manures in the vineyard should be avoided. Unleached wood ashes are highly beneficial especially on all gravelly or sandy soils and with lime added on deep loamy soils that may be lacking in the element of potash with a tendency to become soured. Perhaps clay soils are least benefited by the use of ashes since they usually contain a liberal supply of potash. The most favorable location for the vineyard is where a free circulation of air can be had and where the sunlight will reach the vines during the greater part of the day for heat and perfect air circulation are very essential requisites in successful grape culture and for these reasons a gradual or even quite steep slope to the south or southeast should be chosen yet at the same time I have known vines to do almost equally as well on a level tract or on our high ridge lands as on a southern exposure with the exception that the fruit is a little later in ripening. If I could not be accommodated with the most favorable site rather than to be without the luscious fruit I should plant some of our earliest and hardiest sorts even on a western or northern hillside with the conscious assurance that I would not meet with failure.

The thrift and fruitfulness of the vine will depend much upon how it is trellised and pruned, while we must also consider that there is one plot of land devoted to fruit raising that needs perfect cultivation and freedom from grass and all weeds more

than any other. It is that portion that is assigned to the vineyard. While my first lessons in grape growing were taken from an experienced fruitman from York state who trained each hill to a single stake and practiced very low pruning thus forcing the fruit to grow and ripen close to the ground, my own experience proves that throughout this northwestern country that the three wire trellis system is far preferable to the former method. In constructing the trellis, good durable posts seven feet long should be used, being set at least two feet in the ground and not more than two rods apart in the row, the end post being securely braced. Galvanized wire should always be used—about the No. 18 in size—and the bottom wire should be stapled 20 or 24 inches above ground, the top wire being two inches below the top of the post and dividing the distance between these two for the middle wire.

In the very important matter of pruning the vine is where many and especially the amateur fails, yet when the proper method is once fairly understood nothing is easier or more rapidly accomplished. Vines are frequently set too closely and the very common mistake made in cutting away too much of the fruiting wood. I have found that a majority of farmers and city residents who in a way have endeavored to produce sufficient grapes for home consumption have not learned that grapes do not grow on two year old wood and who in their indiscriminate pruning, if they prune at all, only succeed in cutting away a large share of the fruiting wood. While for a series of years I have met with good success in the production of paying crops of grapes not a few of my neighbors who possess equally as favorable location and soils and even with the closest instructions often make a failure in their attempt to grow grapes and this emphasizes the fact that the matter of successful grape culture is largely in the hands of the cultivator whatever may be the nature of the soil and other minor conditions. In regard to desirable varieties I may say that with the experience of years with many of the leading sorts I can safely select for my own location a few of the very best and they are few indeed and yet abundantly sufficient to meet all our needs. Grapes, as is also true of all other kinds of fruit, may be classed as good, better, best. As for me I have use only for the best. Generally speaking those which are best for the distant consumer are also equally good for our own families and in our own homes. Making of course the usual exception in individual tastes. While the Concord has for many years past and is still the standard commercial grape of our Michigan, Ohio and Western New York growers, and while for a series of years I

also regarded it as being the best among many and grew it almost exclusively, I have now nearly dispensed with it except to retain a few vines for the sole purpose of prolonging the season and yet I regard the Concord grape as being an excellent sort wherever it will come to perfect maturity, but I have found that in northern Iowa we have occasional unfavorable seasons when its fruit will not ripen perfectly and much of it is rendered unsalable except for culinary uses. Moore's Early and Worden are the two principle sorts grown on my own grounds. The former will ripen about ten days earlier than Concord, will sell for about double the price of the latter, appears to be equally as hardy in vine, and is less subject to mildew and scab. As I have grown it the berries are a little larger and the clusters more compact than the old standard sort above mentioned while the quality of the fruit when well ripened is decidedly good for all purposes.

The Worden follows in season of ripening being a few days earlier than the Concord but like its parent it is somewhat subject to skin bursting as the skin of the Worden is especially thin and tender and is also somewhat subject in unfavorable seasons to mildew and scab, but after all it is one of the very best varieties for family uses. For a succession of fruit for garden culture I feel that I can safely recommend the three varieties I have referred to in the following proportion: three Moore's Early, two Worden and one Concord.

I have not found a variety of red or white grapes that has proved profitable for commercial purposes while a few people appreciate as a change some distinct flavored sort such as Agawam, Moore's Diamond, Delaware or Brighton (which I prefer to all red varieties) yet the popular taste calls for a black grape for a continuous supply both for the table and for culinary uses. All things considered and for various reasons before stated if I was to be confined to a single variety for general purposes that one would be without question Moore's Early, it being understood that I am making this choice for my own locality but do not with any certainty recommend any distinct variety as being fully adapted to all parts of Wisconsin or other states and yet I feel that I can with much confidence recommend Moore's Early and Worden as the two varieties possessing the highest qualities and as giving the greatest promise of success of all varieties with which I have had experience and I believe that no one should hesitate to plant either or both of these freely in almost any part of central or southern Wisconsin. It might be a matter of interest to some for me to state that my own vines during the past year produced on an average of 32

pounds of fruit to the vine, the average returns per vine being about 55 cents. Now I have covered but a small portion of the ground suggested by my subject but I feel confident that what may be lacking in the matter of information and interest in the paper will appear and be made plain in the discussions that may follow it.

DISCUSSION.

Mr. Smith: I would like to ask about the Janesville grape, what your experience is with that.

Mr. True: I have never grown it.

Mr. Kellogg: What do you do for the mildew and scab which you spoke of?

Mr. True: I have never been seriously troubled with mildew and scab until a year ago last summer, then more than one half of my crop was destroyed. A few other seasons previous to that I had a slight attack. I never had sprayed my vines or used any other method to work against these diseases. Last year I made up my mind to know whether there was any virtue in spraying for mildew and scab. I have a spraying apparatus, what is called the Barrel pump spray and after I had my vines up on the trellis and before the buds opened I went over the whole vineyard and gave them a thorough spraying with the liquid Bordeaux mixture. After that I also used the dust spray. I had a dust spray apparatus and after the blossoms came out I went very early in the morning with the dust spray, I think I went over them with the dust spray about four times a season. I found that with the dust spray in an hour or two hours I could go over a great many vines. I had to get up at about four o'clock and go over the vines while the dew was on, or mist. I do not know that possibly my grapes this year might have been free from mildew and scab if I had not sprayed, but I will say this, that when I came to gather my fruit I could not detect a particle of mildew on any, except a little on the Moore's Diamond, and nicer grapes I never grew. Whether it was on account of the spraying or not, I do not know, but I never shall pass another season without spraying.

Mr. Smith: How many branches do you leave to a vine?

Mr. True: I have my rows about ten feet apart and I leave two canes, letting one cane run on one vine in one direction and another in another direction. On the Worden and Concord I use

three buds, the Concord is not quite as heavy a bearer. I prune my Moore's Early to four or five buds and if you prune Moore's Early, take, say five buds, I think you will obtain as many vines to the bud as you will on the Worden and Concord.

Mr. Smith: Have you done summer pruning?

Mr. True: Yes, I have done summer pruning somewhat, just enough to get the new growth of the vines out of my way for cultivation and in connection with that I would say this year I tried a little experiment on a few vines just to see what the result would be of cutting back very closely to see if it would not hasten the ripening of the fruit and I found it was rather bad practice, it rather retards ripening than hastens it. I girdled a few vines to see what effect that would have and I find you can increase the earliness of the ripening of the Concord fruit from four to five days to a week by girdling the vine when the grape is fully grown and before it begins to color.

Mr. Turner: I would like to ask if you recommend the dust spray in grape culture?

Mr. True: I have faith enough in the dust spray to use it myself, this has been the first year. I also used it in my apple orchard extensively. I think there is a great deal of virtue in the dust spray, but I think it requires more applications than the liquid spray to obtain the same results. But I do like the dust spray, especially in spraying grape vines that are low down and you can get over a great deal of ground. I cannot see why the Bordeaux mixture applied in the dust form upon the moist surface, when that becomes dissolved in dew along the leaves and branches of the vine, why it is not as good as the liquid spray. I know it is much more easy to apply, as it comes mixed.

Mr. Turner: Would that be practical in commercial orchards with large trees?

Mr. True: I think it would to quite an extent, it would depend a great deal on the apparatus that you use in putting it on, if you can reach the top of the tree. I can spray into the top of the tree twenty feet high, when there is a slight breeze.

Mr. Reigel: Will you describe the scab so that any one who does not know it may recognize it?

Mr. True: It is simply scab. If you have an injury on the back of the hand and the scab forms there, you know what it is, you call it a scab. Now, it is somewhat similar to the spots that you will see on the grape after the scab has struck it. The scab will sometimes appear on the young growth of the vine, on the leaves or wood of the new growth, but the greatest injury is done, it seems to me, by the spore, which is a very small spot

at first, but it increases in size until in some cases it covers nearly one-half of the fruit. It is a dark, scabby crust that forms over and renders it unsalable.

Mr. Reigel: There was something the matter with my grapes this year and slightly last year. I noticed upon the young foliage that the little ribs that pass from the center would be attacked by some disease that would make the leaves curl and the tender portions of the vines would have black spots on them.

Mr. True: Mildew will have that effect. I am somewhat inclined to think that the condition that you describe appearing on your grape vine is what we call the anthracnose on the raspberry, but it may not be the same.

Mr. Smith: Have you ever used bone dust on your grapes?

Mr. True: I have not, I have used wood ashes a great deal.

Mr. Hutchins: At what time does the scab makes its appearance?

Mr. True: It varies and its appearance is governed largely by the condition of the weather. In a cold and wet season the mildew and scab will be more prevalent than in a dry, warm season if you have the right conditions. From the time the grapes are set until they are half grown, the scab will appear, it is owing quite a little to the condition of the weather.

Mr. Bryant: I think it ought to be stated in this connection that our spraying measures are simply preventive and not curative. You do not wait until you have the scab and mildew before you apply the remedy, it should be put on as a sort of insurance.

Mr. True: I am glad Mr. Bryant spoke of that. I will tell you, the secret both in the orchard and the vineyard for the prevention of scab and mildew and fungous disease is, as Prof. Beach said, in getting the preventive there before the disease makes its appearance. You must spray early, even before the leaves have opened if you want to get ahead of these fungous diseases and mildew. It is very essential that you should spray early.

Mr. M. S. Kellogg: I understand Mr. True to advocate the applying of spray on orchard and garden crops before the foliage starts at all; that is for a commercial man, but for the farmer, is it necessary for him to spray before it starts?

Mr. True: I think it is, to get ahead of the fungus. I think we should spray if we do not expect any crop of fruit even, I think we should spray our young orchards and do all that we can to prevent the disease from getting there.

A Member: Will the anthracnose spread from raspberries to grapes if they are planted side by side?

Mr. True: I could not answer that question, I presume Prof. Hansen can.

Prof. Hansen: I do not think they have anything to do with each other, as far as I have heard.

Mr. Toole: The Delaware, the Brighton, the Green Mountain and Moore's Diamond, would not you recommend to amateurs to try them, or is there too much disappointment following those?

Mr. True: In a small way, yes. As I stated, I regard the Brighton among the best of the grapes of that character. I do not fancy Moore's Diamond, it does not please my taste. I had a great many customers in my town for it, at least I sold nearly all my grapes in the vineyard and it was a common expression "Moore's Early is the best grape you have for customers." I like to grow different vines, there is a difference in taste, but you will find as a general thing that the customer calls for the very best black grapes and that is what will go best in the market.

Mr. G. J. Kellogg: What is the latest keeper that you have?

Mr. True: I have not tried to keep grapes very long, I have kept some in the cellar until Christmas time wrapped in a layer of cotton. I have not tried any other method of keeping them.

Geo. J. Kellogg: Grapes were an excellent crop in 1906. I have about twenty five vines in my garden at Lake Mills. The summer of 1905 they were nearly killed with mildew. I did not spray until too late to check it.

In 1906 I commenced spraying with blue vitrol water before the buds opened, using this on both vines and all trees. After the buds opened I added the lime and continued spraying every two weeks until the grapes were nearly grown. Some of the bunches showed traces of the Bordeaux at picking time.

One especial advantage in spraying before the buds start is dispensing with the lime which always clogs the spray more or less.

The strawberries should be sprayed twice before blossoming and three times after with Bordeaux.

FRUIT MARKETING SESSION.

SOME PROBLEMS IN CO-OPERATIVE FRUIT MARKETING.

CO-OPERATIVE MARKETING OF FRUITS.

E. A. RICHARDSON,

Manager Sparta Fruit Growers & Shippers' Ass'n, Sparta, Wis.

The marketing of our fruits is a subject of vital importance to every horticulturist, whether he raises a few square rods of strawberries to supply the demands of his local market, or whether he has twenty, forty, or even more acres devoted to the production of the different kinds of fruit which will be placed on a more extended market thereby coming in competition with that shipped from other places. The failure of co-operative associations in the past has raised the question in the minds of many whether it was advisable to market their produce through co-operation, or each grower attend to the marketing of his own products; for unless you are able to thoroughly convince a grower that it is to his interest, and that he will be materially benefited by such co-operation, you surely cannot blame him for wishing to have immediate supervision over the financial end of his own business.

In tracing the cause of these failures, we invariably find either a lack of good sound business principles, too much leniency or liberty given the grower, or a management which did not have the confidence of its members as well as the confidence of the parties who were to handle their fruit.

The advantages to be derived by co-operation in reaching distant markets, securing minimum freight and express rates, and getting a larger and better distribution of our products, are so

great and appeals so directly to the profit and loss side of the question, that no person who has studied them can fail to see that it is to his interests to join with his neighbor and take advantage of the conditions as they find them, thereby making his account at the end of the season show a profit where otherwise there would have been a loss.

In organizing an association for the co-operative marketing of fruits, each association will be obliged to enact by-laws and rules, which would appear to be essential for the best handling of the products in their locality, and to attain the aim for which the association was organized.

The plan of our association at Sparta is absolute co-operation. Each grower belonging to the association delivers his fruit to the manager, taking a receipt therefor, and the fruit is then either sold on the open market, shipped out on standing orders to local dealers throughout the country, or consigned to some responsible commission house, as the manager in his judgment thinks best, and returns made to the growers on each days shipment, pro rata according to grade. By this method our manager can avoid overstocking any one market so far as shipments from this one place. He can readily keep in touch with all the principal markets and by a little judicious advertising can let it be known that dealers may send in their orders with an assurance that they will be promptly filled with good fresh fruit. This has enabled us to obtain a price for our produce which the individual cannot get.

We have further advantage in the fact that we have a man who devotes his whole time looking up the market, receiving quotations from the different cities, and who is conversant with the conditions from day to day and thereby enabled to profit by any change that may occur in any market which we may be shipping to. He can send daily quotations to his regular customers, and above all things, keep in touch with other associations as to their probable shipments, destination, and daily price.

Co-operative marketing enables the grower to devote more of his time in getting his fruit in the best possible condition to put on the market, and invariably raises the standard of quality, a fact which today means many dollars in his pockets, and relieves him of the arduous duty of trying to keep even with the commission man.

Our association was organized in May, 1896, after a large amount of labor performed by five or six of the principal growers, under the most crude, and I believe, the most unsatisfactory constitution and by-laws that any association was ever or-

ganized under. The association as organized at that time gave its members the privilege of selling their fruit on our streets to any buyer who would make them an offer; it further gave them the privilege of saying to what city their fruit should be shipped. The only restriction placed on their shipments was, that when shipping to a city where the association had an agent they were to ship to that agent only, a restriction which did not hinder any other commission man from that city buying and shipping onto the same market—in other words, our association was practically an association in name only. And yet it had its good results, for we were able by this co-operation to make shipments by refrigerator cars, securing a minimum freight rate, and to receive some recognition which is accorded many larger and stronger organizations.

Our present plan of organization has just finished its first year in a most profitable and satisfactory manner, having done a business of over forty-seven thousand dollars, at an expense of only two and one-half per cent to its members, and also having received higher prices for our fruit as a whole than we have been able to get for the last seventeen years, which is as far back as I have any record.

The adoption of a system of grading of strawberries gave us the most thought and worry, as we realized that nearly every person is liable to think that his fruit is as good as his neighbor's, but finally we settled upon three grades, namely, "Choice", "Extra Choice", and "Fancy", with the grade marks of B, A and X. To these we soon found that we had to add one more, which we called "no grade", it being applied to the very small buttony stuff which some growers will persist in putting in to fill up the box. On the start some few of our members questioned the justice of some of our grading, but after changing graders once or twice, when a question as to grade was raised a comparison of the two grades placed side by side was sufficient to satisfy the most skeptical as to the grade which his stock belonged to. We did not establish a system of grading for raspberries and blackberries the past season, but I am of the opinion that it would be advisable to do so.

One of the most serious problems was to get some of the growers to deliver their fruit early enough in the afternoon so that we might be able to get it on the first outgoing train, thereby reaching some of the farthest and best markets throughout the Dakotas the following morning. These are a few of the problems we have had to solve this past season, and we found that conditions would confront us from day to day which would tax the ingenuity of the manager to its utmost to settle in a

manner satisfactory to all, but with the hearty co-operation of the president, directors, and in fact nearly all of our one hundred forty odd members, we have been able to demonstrate to our satisfaction, that without co-operation the majority of us would be at the mercy of the man at the other end of the line, and consequently would have to engage in some other occupation.

As a proof of this statement, I will here say that the members of our association at its annual meeting held on the 2nd day of February, were so well satisfied with co-operation that they took steps to raise their capital stock from one thousand to six thousand dollars, and have already made arrangements for the purchase of a piece of property for office room and a place of business, costing \$3,000, with the intention of manufacturing and furnishing its members with their fruit packages and handling such other produce as our members have to put upon the market.

DISCUSSION.

Mr. Kellogg: How do you grade the fruit after it is received?

Mr. Richardson: Our association went to the railroad company and we got the Chicago, Milwaukee & St. Paul railroad, which is the road that we largely ship our freight over, and we got them to put us up a shed twelve feet wide by 50 feet long, in other words, it was about long enough to take in two car doors. All the fruit shipments are delivered into that place and unloaded onto this platform. We have a grader there that goes through the different loads that come in and grades them according to his estimate.

Mr. Kellogg: You do not sort them at all, just take the appearance of the boxes?

Mr. Richardson: If a person comes in with thirty or forty cases, our grader does not go through every one; in a load of twenty or thirty cases he will take off five or six cases and he grades the load according to the grade that he inspects. In other words, if a grower comes in and says, "Here are so many of my best berries, they will probably grade so-and-so," why, he goes through that pile and if he finds one in there that is inferior, if he finds one case that is inferior to the rest of them, they are all marked poorest grade.

Mr. Daub: What do you call the fundamental principle, or the best principle involved in your co-operation, I mean to say, what do you think is the leading object in co-operation?

Mr. Richardson: I think the objects are so great and numerous that there is no leading object. It is well set forth in the distribution of fruit and bringing up the standard of the fruit, that is, getting the members so that they will put their fruit up in better packages and better shape and we all know that in co-operation and distributing fruit throughout the country that we are not piling fruit into one market.

Mr. Daub: Is it not a fact that the shipping facilities are the life and the body of the co-operation? Is it not a fact that without the shipping facilities obtained through co-operation you would be at sea, that is, you would be an utter failure? Without shipping facilities we cannot handle fruit.

Mr. Richardson: Well, in answering that question, I would say this, that there is not any association that can enhance shipping facilities a great deal only in the way of loading cars. We have shipping facilities through railroads, we have the Northwestern and Milwaukee, and either railroad will do almost anything for us to get us to ship over their road whether we are co-operating or not, but I think that is all right, that is one good point.

Mr. Daub: If I ship individually my berries go in with dead calves, live pigs, mice, any old truck that happens to be in there, that has been my experience and when those berries arrive at the other end, even though they were first class when shipped, they were not in good condition when received. Under the facilities of co-operation, you load yourself, you either ice your car yourself or you have the railroad company ice them and you look to see that they put a proper amount of ice on, not put in half a ton when they should put in three and a half tons, and you load so that your berries will not shake. When your berries are loaded by the common truckman, they are dumped here and there and the dumping is injurious to them and besides that, they are piled up here and perhaps when they arrive at the other end they are all in a heap, you don't know how many times they are tumbled over during the transportation, and that is one of the reasons why we should co-operate. The shipping I think is the most vital point.

Mr. M. S. Kellogg: I would like to ask Mr. Richardson about how many acres their association takes care of in berries?

Mr. Richardson: I do not know that I can tell you the exact number of acres.

Mr. Hanchett: We have 500 acres of strawberries.

Mr. Kellogg: I would like to know how many acres it is necessary to have in order to have an association. The berry growers in our neighborhood do not ship; we have a market there that consumes practically all the berries that are produced in our immediate neighborhood and the question has been discussed among some of the berry growers whether it would be to our advantage to organize a co-operative association and handle berries on the local market. There is no question but what we could get more money if the fruit were graded, but the question is, can we afford to support a man as manager with, say 100, or 60 to 75 acres of strawberries?

Mr. Richardson: I think you could, Mr. Kellogg, for this reason, you could get some party that would attend to that who might be engaged in some other occupation that did not require all of his time. We found in Sparta last year that while we had a great deal of opposition from some of our retail grocery-men there, they were working against us because they thought we were going to put up the prices, there were others that bought all of their goods from us. They would come to our office in the morning and they would say, "Mr. Richardson, I want so many cases of 'A' and so many cases of 'B'," and they would have a chance then to select just what they wanted for the trade which they had to take care of. Our expenses this year were about \$1,200, something like that, and in answering this question of acreage, I can give you the exact amount that we shipped through the association. Of strawberries, we shipped 16,843 cases; at an average of \$1.35 a crate. That was for sixteen-quart cases, our choice berries. Our grade "B" averaged us \$1.12, a crate, our grade "A", the extra choice, \$1.40, and our "X" grade averaged \$1.53, while the "no" grade I think we had something like 100 cases, averaged us only 70 cents. In the red raspberries, we had 5,610 cases, averaging \$1.53 for twenty-four pints. The black raspberries, 1,666 cases, averaging \$1.49. Blackberries, 8,355 cases, averaging \$1.30; we put all our blackberries up in twenty-four pints. We used to put them altogether in sixteen-quart cases, but I do not think there was a dozen of the sixteen quart crates used in our association last year. We find that they will carry better and the trade seems to like the twenty-four pint crate better than they do the sixteen and we certainly get more out of it.

Mr. C. L. Richardson: Do you lower a man's grade on account of the fruit being picked during a rain, or before the dew is off in the morning?

Mr. Richardson: We make no difference as long as they are all alike. You understand if a man goes out he has to pick

early in the morning. We do not pay any attention to the dew in the morning. Some of them have to come four or five to six miles to town and our main express leaves Sparta from four to half-past four in the afternoon, so you see they have got to get their picking done early in order to get them in. Of course, if the berries are soft, we drop them.

Mr. Menn: What is the farthest distance that some of your members bring the berries?

Mr. Richardson: We have three members that probably bring them about thirteen miles, but we do not care about getting them in, of course we had to take them in starting our organization.

FRUIT MARKETING.

C. H. DAUB, Eau Claire.

I represent the Eau Claire Fruit Growers who were organized in 1902 with a capital stock of \$200; we have not gone into bankruptcy yet, and have a little money on hand. Our method of doing business has been somewhat vague. The first few years we hired a manager to whom we gave almost absolute control. Our method had been soliciting some of the best commission men north and west of us, that is, Duluth, Ashland, Superior and Minneapolis. Duluth is our market and we can compete with any one in Duluth, even with Sparta, at ten cents less a case than anybody else. We can pick our berries any day at Eau Claire up until five o'clock, load them into refrigerator cars and at seven o'clock in the morning the grocery-men in Duluth are ready to take them and offer them for sale. I believe that the method we pursue in shipping is almost ideal, while perhaps not as economical as it might be. We have iced our own cars, not loading them to the minimum, which means only about one half, but we pay the whole freight and in that manner we load them under ideal conditions, they are not jammed and knocked around and they arrive in Duluth in just as good condition as if delivered in Madison by a grower within five to ten miles of the city. We load them ourselves and the commission man takes them out. Last year our crop was small, owing to the plants dying off. (I do not agree with the idea that it was winter killing, I believe it is a disease. My plants that died were almost exclusively new settings and on going over to my neighbors for a distance of five or six miles I found the

same condition prevailing everywhere. Not more than twenty per cent of the entire new setting produced a crop, the old beds apparently surviving. I think there is a disease at the bottom of it and that can be controlled with Bordeaux mixture.) This last year we started out to make a contract with the best commission men. There being some dissatisfaction and the crop being small, we found that we could sell them direct, so they had their representatives come, three or four of them, and they bought most of our best berries and paid us from \$1.00 to \$1.90 for sixteen quart crates right there, but when the poorer berries came in, some of the growers only got about fifty to sixty cents for them and the poorer berry was in the majority, it always is, like the poor man. I believe the gentlemen preceding me advocated very strongly selling one's own product. It is impossible, I believe. The strawberry grower has to pick his berry today and it has to be eaten tomorrow. He has to have an army of men disposing of the crop and the commission man is in a position to take that risk and he does take it. It is beyond the power of the grower to sell his crop. I tried it, I shipped over to the North here and there, now and then, half of my crop, divided it, and I thought I was doing fine; some of the men paid me promptly and some did not pay me at all, and I had the additional care of making out shipping bills and being worried. Averaging it all up, I did not receive any more than I got from the commission men. Besides that, I was very careful to give them the best article I had; I had to, because on the end of my boxes there is printed "Washington Fruit Farm" with a big picture of George Washington, so you know it would not do for me to lie. It worked fine the first year, because I had an A No. 1 crop, but if one has a poor crop, one could not put on the name of George Washington. Well, as I said, the last year has not been as prosperous as I could have wished; we had only a very few berries because they were all killed out. We have shipped as many as 3,000 cases in one day. I think that Eau Claire county is especially adapted for growing strawberries as we have ideal conditions. We have a diversity of soil, and some of the soil is of the very best for producing strawberries, being a sandy loam. We used to think we could not raise strawberries, I used to be one of them, when berries were twenty-five cents a quart at retail. We can raise an A No. 1 berry. I have seen our berries in the market of Duluth two days after they were picked and they were in a fine condition. Of course the commission man said that was not always the case, and I know it is not, for the last two years have been very bad, being a little bit too wet. We do not think we have to ask any odds of the

Sparta people, while they are raising a fine berry, I think it is a little bit inferior to the Eau Claire berry on account of their having a heavier soil than is necessary. The strawberry does not want a heavy soil, it wants a soil that is rather on the light order and I think we have that condition in Eau Claire. I have kept berries in a case and I found that after a day or two I could empty them over on a white paper and shake them up and empty them back and the paper would be unstained. When we have a good crop we sell them freely and sell them cheaply to educate the public taste, and I will defy any one to say that there is a finer fruit or more healthful or a better fruit than the strawberry. The Eau Claire Fruit Growers' Association started in 1902 and has confined itself entirely to the growing and marketing of strawberries and a few raspberries and it has done a fairly good business until the last year, which I think we can call a failure, not so much on account of our method of doing business, but on account of crop failure. I think the commission man is our only salvation, if we deal with an honest party.

ORGANIZATIONS FOR SELLING FRUIT.

J. B. GRAVES,

President Neosho Fruit Growers' Ass'n, Neosho, Mo.

It is coming generally to be believed that it is best for fruit growers to co-operate in selling their fruit. There are exceptions to the general rule. If a man is a capable business man, if he is an intelligent fruit grower, if he thoroughly understands the details of the fruit business, if he understands the best methods and the objects of cultivation, if he understands how successfully to combat insect pests and fungus diseases, if he understands how properly to thin, prune and feed his fruit, if he understands how to gather, grade and pack it, if he understands what kind of packages to use, if he understands what markets to put his fruit into, if he knows how to deal with track buyers and commission merchants, if he has a good reputation in the markets for honesty and the production of fancy fruit, if he knows how to collect his returns promptly and use them advantageously, and if he grows fruit on an extensive scale, then he would do better to ship independently and not to co-

operate with his less intelligent and less skillful neighbors. But such a man is rarely found. Hence the general rule stands true.

The cotton growers of Texas organized to sell their cotton. The grain growers of Oklahoma organized to sell their grain. The truck growers of the south organized to sell their truck. The fruit growers of the far west organized to sell their fruit. All these found it to their advantage to do so. Through their organization they both lowered their shipping expenses and raised the price of their products. Craftsmen and tradesmen of many sorts and kinds have formed themselves into unions and federations of various sorts and names to raise the price of labor, and beyond all question they have raised it. They have raised it so high that a farmer can hardly hire a man at all. Fruit growers cannot afford to be one whit behind the very chiefest of American producers in the matter of concentration and organization. The more complete the organization the more complete the advantage. Down at Neosho, Mo., where my home is, we have an organization of fruit growers that has been fairly successful in its business, and has made a good reputation throughout Missouri and in all the markets where it has done business.

Let me speak of that organization, of its workings and results. I will not ask your pardon for talking about ourselves, for using personal pronouns, for I was invited here by your worthy secretary to do that very thing. If I did not do so, I would not be fulfilling my call. The only excuse I have to offer is, I have a divine call to speak that I do know and to testify that I have seen.

We have an organization of about 140 members. I have the honor at present of being the president of our association. We have been organized about ten years. At that time we had nearly 200 members. Some have died, some have moved away, some have lapsed and some have collapsed. One hundred and forty remain to keep up the battle.

The officers of our society consist of president, vice-president, secretary, treasurer, chaplain and a business committee of five, one of whom is corresponding secretary and business manager. We pay the business manager for his services two per cent of the gross sales of our fruit. Out of this amount he pays his assistant, the bookkeeper, the inspectors at the loading station and all the helpers that are necessary to load the fruit upon the cars. When these are paid there is left the manager about \$1,000, sometimes a little more and sometimes a little less. We prefer paying a commission to paying a salary for three reasons: the

commission has a tendency to stimulate the manager to do his best for the growers, for the more fruit he can sell at a good price the more he will make for himself. In case of a shortage of crops he will fare and fall with the rest of us, and in case of a total failure we will not have to go down into our empty pockets to pay him for the work which he did not do.

We put upon our business committee men of recognized business sense. We select for our manager a man of demonstrated business ability, a man in whom the association has the utmost confidence, both in his competency and his honesty. We believe that it is one thing to grow fruit, and quite another thing to market it successfully. Fruit growing is a science. Fruit selling is a fine art. Fruit growing depends upon definite, fundamental, unchangeable principles. Fruit selling depends upon uncertain, superficial, fluctuating conditions. In fruit growing, one must study climates, soils, locations, variations, planting, cultivation, pests, diseases, remedies, picking, packing, delivering and such things. In fruit selling, one must study men, railroad companies, express companies, refrigeration companies, cities, the conditions of markets, the standing of commission merchants, industrial conditions, distribution of wealth, supply and demand and such things. Fruit growing and fruit selling are two very different classes of business so that a man might be a perfect success in one and a perfect failure in the other. For this reason we select for our business manager a wide awake, thorough, capable business man. He sells the fruit. The rest of us are relieved of that responsibility and we give our undivided attention to its production.

We have a constitution and by-laws by which we are governed. In it are pointed out the duties of the different officers and members. In it is specified who may become members and upon what conditions they may remain. In it are pointed out how the officers are paid for their services and the growers for their fruit. In it is specified that the growers must deliver all their fruit which they have to sell to the manager, and that they must not pay more than the association price for picking on pain of expulsion. In it is specified that the fruit must be carefully graded "A" and "B" and that if any does not meet the requirements of the "B" grade it will not be shipped at all. These rules tend to keep the members together, to regulate the price of labor, and to produce a uniform pack.

The business committee hold meetings as often as they think necessary to look after the interests of the association. They consider every subject thought to be of importance to the growers. They provide the growers with box and package material.

They provide them with stamping outfits and every grower is required to put his individual stamp upon both ends of every crate. And on every crate of the "A" grade the manager puts the association trade-mark, a copyrighted stamp, which is the association's guarantee of high quality. They provide them with tally sheets with which to keep the account of the berry picking. They provide them with pickers' and packers' rules, with bills and posters for advertising for pickers, and with all other needed supplies. They make arrangements beforehand with commission merchants to handle our fruit the ensuing season. They know before the berries are grown where the bulk of them will be marketed. We never sell to track buyers. We always consign to commission merchants. We have demonstrated to our satisfaction that it is to our advantage to do so. We stand by the commission people in the beginning and they stand by us in the end when track buyers would desert us. They arrange with the railroads for cars. They arrange with railway and express companies for refrigeration. They arrange for receiving cars in transit. They arrange with electric light and telephone companies for their services. They arrange with numerous men for their services as bookkeeper, inspector, loader at the shipping station or instructor in the field. They look after all the details of the business, having authority to attend to it just as though it were their own.

Having briefly outlined the working of our organization, I will now speak of its advantages. Through organization we have been able to make more satisfactory banking arrangements than we ever made before. In a sense the First National Bank of Neosho stands behind our association. It has treated us very courteously, and has extended us many favors. For the convenience of growers it has provided an ample supply of small currency for their use in paying pickers, enabling them to make the correct change. It has offered the association the free use of the directors' parlor as an office for our business manager and the bookkeeper during the busy season, and there the growers are paid for their fruit. If any grower needs money to buy his package material early in the season he can get it at the bank by making a personal note and attaching to it an order to the business manager to pay the note off out of the first money received for his berries. This is to the grower's advantage because he can get box material at six per cent discount in December. If any grower needs money to pay his pickers and other helpers during the picking season, and before he has received any returns for the fruit he has shipped, the bank will advance forty per cent of the value of his fruit for his use without in-

terest. This makes it easy for the grower to accommodate his workers without any trouble or embarrassment to himself. These and some other minor arrangements have been very helpful to the growers and are the results of our organization.

By co-operation we get our crate material cheaper. Our association uses about ten carloads of box stuff every year. By buying this amount in a wholesale way of one factory we get it cheaper than if we were to buy the same amount individually of a local agent. Besides, by buying in such quantities we have in late years brought the jobbers into competition for our trade, and they have cut one another's prices. In this way we have beaten down the price and saved our association last year \$800. This year the factories are in a trust and prices are practically uniform. In the same way, by co-operation in wholesale buying, the Hood River Apple Growers' Union saved last year \$7,500 on their apple boxes, paper, and spraying material. Many other fruit unions throughout the country have sought and found the same advantage, and some western unions have recently been formed with this item especially in view.

By co-operation we have reduced our shipping expenses and gained a better market for our fruit. Before our organization, the growers shipped independently in small lots by express to nearby towns. But express charges are high, much higher than freight rates. By co-operation we combine the small lots of many growers and are able to ship in carlots under refrigeration to distant cities. This secured us cheaper rates and higher prices. We cannot afford to ship by express to distant markets for two reasons: first, the charges are prohibitive; and second, the berries will not stand up and reach the market in good condition in heated express cars. Besides, fruit shipped by express is sometimes very roughly handled. But in a refrigerator car the crates are slatted and nailed, staunchly braced, well iced and ventilated, and in such condition can be shipped across the continent to the best markets in the land. Thus through co-operation in carlot shipments, rates are cheaper, temperature is lower, the handling is decidedly better, distant markets can be reached, fruit arrives in better condition, and higher prices are secured.

We have secured better shipping facilities and better railway service. We have two railroads at our place. They both have lines to Kansas City, our great distributing center, one direct and the other indirect. We do business with both roads. The rates are the same, but the service is different. While there is no competition between the roads, no cutting of rates, they both solicit our business. They can afford to solicit it, for some years it is equivalent in profits to the railroads to the haul-

ing of five hundred cars of lumber, and it is all done in less than thirty days. While we do business with both roads the bulk of it is done with one, because it is more accommodating than the other. It has built for us with a little of our help, a loading shed nearly 200 feet long at which five cars can be loaded at a time. It gives our cars in transit more attention than the other. It keeps its promises to us better. It pays our claims more promptly and fully. It treats us with more courtesy and consideration. It tries to rush our berries to market with all possible expedition. At our solicitation it put on a special strawberry train. That train begins to pick up cars in Arkansas and closes up with our station at midnight. Then it heads for Kansas City. At Kansas City it connects with a fast Armour meat train and hauls our fruit to Minneapolis and other northern cities twenty-four hours quicker than the old way. That quick handling of our strawberries has been a great help to our association. It has put our fruit into the market in better condition and has given us the advantage of an earlier and higher sale. Now these results could not have been obtained but by concerted action.

I pass now to consider some matters which some may think are not relevant to the subject in hand. Directly they are not. Indirectly they are. In days ago a celebrated cook book contained a receipt for cooking a hare. In the introduction the author said, "First catch the hare." Catching and cooking are closely enough related to be included in the same receipt for cooking a hare. So growing and selling fruit are closely enough related to be included in the same receipt for selling fruit. Through organization growers are stimulated to adopt better cultural methods for the production of their fruit. In our association, after the routine business is disposed of, we are in the habit of discussing some phase of fruit culture. We hold experience meetings, in which we relate our ways of doing things, our successes and our failures. We have a kind of correspondence school in which the initiated instruct the aspiring; in which the aged teach the young; in which the veteran guides new recruits. The most experienced and successful growers are called upon to tell how they prepare their fields for the planting of a new bed, how they plant, how they cultivate, how they thin, how they renew an old bed, how they produce fancy fruit. They tell all these things and show how they do it, and thus we learn the better way from one another. Besides, we visit one another at different seasons of the year, look over one another's fields, and study one another's methods. When we know a grower has a particularly good field, and that he has marketed a

specially good crop of particularly fine berries, we go to his field, to see what he has done and how he has done it. In this way we catch on. When we come in contact with a patient who is breaking out with a pronounced case of measles we catch the disease and have a spell of it ourselves. So when we come in contact with a man who is breaking out with a pronounced success in growing fruit, due to good cultural methods, we catch the good health, adopt the better method, improve our own ways, and produce better fruit. "Who so looketh into the perfect law of fruit culture, and continueth therein, he being not a forgetful hearer, but a doer of the work, this man shall be blessed in his deed." Now fancy fruit will always sell, and generally it sells readily and at the highest price. It's the sorry fruit that slumps the market and sells slowly, that disgusts the consumer, exasperates the commission merchant and disappoints the producer. Grow better fruit and that in turn will produce a better market.

This leads me to say that organization stimulates the growers to do better grading and packing. If there is any one thing we give more emphasis to than any other in our association it is this: that we should be very careful and painstaking in grading and packing our berries. We print rules for our pickers and packers and tack them up on and in the packing sheds to teach them how to do the work. In the association the growers themselves are instructed upon this subject. In the sheds the growers give this matter their personal attention, or commit it into careful hands who do the work faithfully and well. Inspectors are sent out by the association to the fields to see how the work is done by the individual growers, and to show them how and where to make improvements in their packing. And further, inspectors at the loading station open every crate and if the berries do not meet the packing requirements they are set aside and not shipped. These things cause the growers to be very careful to pack their fruit well, so that they will bear the most rigid inspection. In this way we put a pack upon the market last season which enabled us to get the highest average price of all the berry associations in Missouri and Arkansas which shipped as many carloads as we, or whose period of shipping was co-extensive with ours. We have a commission house in Denver, Colorado, which has handled our fruit for years. It is one of the most celebrated in the West. One year at the close of the berry season, they wrote us saying, "Your berry is second to but one, the Hood River berry, the best berry in the world." One year later, after having another year's experience in handling our berry, after becoming a little better acquainted with

it, they wrote us again saying, "Your berry is the equal of the Hood River berry." One more year later, after having still another year's experience in handling our berry, after noting its size, after seeing its beauty, after testing its quality, after demonstrating its salability, they wrote us once more, saying "Your berry is the superior of the Hood River berry which we had thought was the best berry in the world." We are proud of this record. It is not only complimentary of our work, it gets us the money.

Another illustration of what can be accomplished by high class work in packing is the Hood River Apple Growers' Union. The individual growers of that union do not pack their own fruit. It is packed by the union. The union employs expert packers and one expert is placed with every orchard crew. That crew works under his direction. In this way they get a uniform pack. And how do they pack their fruit? They pack it in boxes, not barrels. The boxes are lined with white paper. The apples are nearly uniform in size. Each apple is a perfect specimen. Every apple is wrapped separately in a printed tissue paper. The apples are packed in rows and layers. A blue layer paper is laid upon the bottom of the box. A blue layer paper is placed between every two layers of apples. The layers are all alike. The bottom layer is as good as the top one. The middle layer is as good as either top or bottom. A blue layer paper is laid upon top, and some of the growers lay upon that a mat with their monogram beautifully printed in letters of gilt. On the ends of the box a label is put, a beautiful label, a work of art, the picture being a reproduction of the Hood River apple in size, color and shape. The sight of that picture makes one's mouth to water and him to imagine he scents the fragrant aroma and tastes the delicious flavor of that prince of western fruit. No marvel, if they pack apples in that way, that they get prices that are the wonder of the world. In 1902 before the organization, the individual growers sold Spitzenbergs for 85 cents per box. In 1903, after their organization the union sold Spitzenbergs for \$2.00 per box; in 1904 for \$2.10; in 1905 for \$2.60; in 1906 for \$3.00; and in 1907 for \$3.15. They attribute their high class packing and their astonishing prices to their organization. I do not say that all apples should be packed in this way and sold for these prices. In fact I am glad they are not. If they were, the common people would be expelled from the garden of economy for eating such forbidden fruit, and banished to the cheerless realms of millionaires. But I do say that good honest packing pays the grower every time.

Another advantage of organization is specialization. I believe in specialism. The association I represent believes in it. There are several berry associations in Missouri and elsewhere that believe in it. Five years ago we grew a dozen different commercial varieties of strawberries. One of our growers experimented with 36 varieties. But we found it confusing to the pickers. They did not all ripen at the same time. They were of different sizes, different shapes, different colors, different carrying qualities and had to be picked in different ways. It was hard to teach the pickers how properly to pick the different varieties. It was difficult to them. It was difficult to the packers and inspectors. It was very troublesome to the salesman who sold the fruit in the cars. So the force of these circumstances drove us to the selection of one variety of berries, the one most adapted to our soil and climate and which we can grow to the highest degree of perfection, and to give almost our entire attention to the production of that variety. We have practically made our reputation on that one variety. Hood River, Oregon, made its reputation on Clark's Seedling. Logan, Missouri, made its reputation on the Gandy. Vanburen, Arkansas, made its reputation on Mitchell's Early and Neosho, Missouri, made its reputation on the Aroma. All these made such reputations as they have by being specialists. There are many stock breeders throughout the country who have achieved great success by giving their entire attention to the growing of one kind of stock, such as Percheron horses, Durham cattle, Duroc-Jersey hogs and Plymouth Rock chickens. I would not limit apple and peach growers to one variety, but I would limit them in commercial growing to a very few popular varieties and to such varieties as are best adapted to their soils, climates and locations. It is much easier for an organization to handle one variety of good fruit than a dozen of common stuff. On this account the tendency of organization is to specialization.

There is one great problem in the fruit business which organization is slowly working out and which it will eventually solve, and that is the problem of disposing of our unmarketable fruit, our culls, our windfalls, our left overs, our immature and rotten fruit, much of which at present is lost. In my neighborhood one orchardist lost last year 3,000 bushels of refuse fruit. Another lost 2,000 bushels. And so it goes all over the country. What shall be done or what can be done with this class of fruit? "Gather up the fragments that nothing is lost." Learn a lesson if you will from the great packing establishments of the land. We send to them many thousands of cattle and hogs every year. At home in butchering them we throw away the hoofs and hair.

We throw away the heads and horns. We throw away the offal, the entrails and the bones. But at the packing house they throw away nothing. They utilize everything. They put everything through a process of some kind, convert it into a by-product of some sort, put it upon the market somewhere and sell it at a profit. That's the result of organization and the application of good business principles to their enterprise. Fruit growers need to organize in their several localities and build canning factories, evaporators, cider presses, vinegar plants and fruit juice factories. They need to pack these No. 1 apples for cold storage and market and all other grades they need to bring to these plants, convert them into desirable by-products of some kind, put them upon a craving market and sell them at a profit. And in this way we, too, can "Gather up the fragments that nothing be lost." These things are coming. They have already reached some localities. We await their general arrival with a great deal of hope. We look to organization to work out this problem and when it is wrought out, and it must be, then the millennium of fruit growing will be at hand. Then commercial orcharding and general fruit growing will be less wasteful and more profitable.

In conclusion, let us not lay again the foundation of individualism, of separatism, of every man for himself and his majesty after us all, but joining hands with our neighbors, let us adopt better cultural methods for the production of fancy fruit, better protective measures for its defense against its natural enemies, and applying better business methods to save the wastes and prepare the perfect produce for a profitable market, let us go on towards perfection in growing and marketing the golden products of the orchard and field.

Dr. Loope: I have often wondered and I think Wisconsin often wonders how it was that the Ben Davis ever got to be of such prominence in this country. The apple, of course, in form and color is nice, but in quality it is way off, as we say, but I want to say that I wonder no more after listening to the address that we had this morning and after seeing the men that Missouri sent out, like this gentleman here, like L. A. Goodman, like George B. Tippins that has come to us. We are in the dark no longer, they have hypnotized the whole world, and I want to say further in regard to this address, that I think I never have listened to an address that covers as with a blanket the whole substance as the address that has been delivered in such concise, epigrammatic way and in such good, square United States talk.

Mr. Daub: This speech reminds me of an old cobbler in England that was very much of a reader, and a great thinker,

and Mr. Gladstone heard about him and he went to see the old cobbler who did not know him, and he conversed with him and when he left the old man said, "I wonder where in the world the old fellow got all my ideas." (Laughter.)

CO-OPERATIVE MARKETING OF FRUIT.

EDW. HUTCHINS, Fennville, Mich.

I am glad to meet the fruit growers of Wisconsin. Every summer when we are shipping the last of our Duchess apples we find the price usually drops and the market reports state that Chicago has a liberal supply from Wisconsin. And upon going up and down South Water street in that city at that time I have seen some as fine Duchess apples from this state as I ever saw. I have been interested, therefore, in meeting the men who grow such nice apples. I am reminded that when I speak of fine apples in this way I must be particular to make myself understood. We think that we grow some fine apples in Michigan and if I am not careful the report may go home that I said those Wisconsin apples were the finest I ever saw and some one will ask me how much I have been around my own state.

I recall the story of the old negro slave who saw a man passing and remarked to his master that that was the finest looking man he ever saw. His master told him he must always except Massa. Presently he saw another man going by and he said to his master, "I declare for it, Massa, dat are man looks de mos' like de debil of anybody I ever see," and then remembering his instruction he added, "'cept Massa." So, in speaking of the nicest apples I ever saw I suppose I must always except Massa, and in order to avoid possible embarrassing complications when I get back home I will say that those Wisconsin Duchess apples were as fine as any I ever saw.

And this brings me to a point which I wish to call attention to, and that is that there is competition between your Wisconsin fruit and our Michigan fruit and I think that I may give bare suggestion to a broader view of the question of co-operative marketing than was perhaps contemplated when the subject was given to me.

In order that there may be effective co-operation there must be an intelligent understanding of the situation. In order to

market our products with the largest measure of profit we must understand two things. We must know the value of the article to be sold and we must also know where the best market is.

It does not reflect a very large degree of sagacity on our part that you of Wisconsin and we of Michigan dump our products together into one market without any very definite knowledge of the condition of that market or of markets in general. It is quite possible that you people here in Wisconsin might have found a more satisfactory market in Duluth or Minneapolis or St. Paul or some western point while we might have sold our apples for a little more in Detroit or Toledo or some city to the east, if only we had known the condition of those markets. So that it appears that knowledge is one of the main things needed in successful marketing, and the question arises whether or not some general scheme of co-operation in securing this is not feasible. We find this is quite important in Michigan in a local way in disposing of our fruit. The buyers come from Benton Harbor or some other place and tell us at Fennville that they can buy all of the Elberta peaches they want elsewhere at 60 cents a bushel and so they can't pay us \$1.00 for ours. And in the absence of reliable information other than their report we are not prepared to dispute them and prices are affected considerably by their bearish reports. In order to be able to meet these men on equal terms some of our growers at a few of the important shipping points have taken the preliminary steps towards the organization of a bureau of information for the purpose of better informing the growers regarding prices and market conditions. Perhaps I ought not to say anything about this as there has not yet been sufficient time to put the plan into practical operation and there are some difficulties yet to be met, so I will only give the general plan of the work. The growers in a given locality are to organize and elect, among their officers, a secretary, who is the person to receive and give out the information. These several secretaries meet once a year and elect a general secretary, who is to gather reports from market centers both local and general regarding prices and market conditions and transmit this information to the local secretaries, and these in turn give it to the members. This may not work out successfully in practical operation and perhaps I ought not to have referred to it. One of the greatest difficulties in the way of inaugurating the system is that so many of the growers fail to realize the value of the information. But I think that it is evident that there is a large need for this information and to recognize a need is one of the first things in the way of instituting the remedy.

Another line of information that is needed is of crop conditions. I think that this is particularly important in disposing of the apple crop. Two years ago if we had known the conditions of the apple crop throughout the country by the middle of August it would have been worth thousands of dollars to the apple growers in one end of the county in which I live. The apple buyers have their organization and had collected the information regarding the condition and size of the crop and they found that it was very short throughout the country and they bought up quantities of apples at less than half what the fruit was worth at gathering time. Last year a very singular condition existed in this country in the apple market. The buyers gave out a report of an abnormally large crop and determined on low prices. It is said that one national association of apple buyers pledged its members under penalty not to pay over \$1.00 per barrel for apples barreled and delivered at shipping stations. The growers were suspicious of these bearish reports and refused to sell at the figure offered and a deadlock existed between the buyers and the growers in many of the apple growing sections until well into the harvesting season, when the buyers made quite liberal concessions. It may be added that from some reports made it appears that the actual pack of apples fell fully one third short of the buyers' estimate of 65 to 70 million barrels.

Now I submit that it would be creditable to the fruit growers of this country if they were to devise some way of procuring this information for themselves. It seems to me that we have the machinery ready made for this purpose. The several State Horticultural societies have a national organization with a representative from each. It seems to me to be perfectly feasible for these secretaries to collect very accurate information regarding the condition and approximate size of the crop in their several states and this information can be interchanged among the secretaries and from them to the members and so the information could be readily supplied. Each season the secretary of our Michigan State Horticultural society sends out cards of inquiry with return cards bearing blanks for reports of the various fruit crops and these are sent to a large number of the leading fruit growers in all parts of the state. The reports so secured are compiled and sent out to the members of the Society and are very valuable. Much aid in marketing the fruit of the state has been secured in this way. Now, if this were carried out in half a dozen of the principal fruit producing states and the information exchanged between the secretaries it would be of large value to the members. \$15.00 for each state would

be sufficient for the purpose of one report and the information would be the most valuable and reliable of any that could be obtained. I am acquainted with the man who reported our section for the apple buyers' association and he had probably not visited a single apple orchard during last season up to the time of making his report, and he had it two or three times larger than the crop would warrant.

But I suppose it is of the co-operative systems that have been in practical operation with us that you wish to hear. We have had three general systems of disposing of our fruit in vogue, consigning to commission houses, selling to buyers who come direct to the orchards or shipping points, and the central packing house system. The last of these is the only one that has been conducted in a co-operative way. Then we have a Fruit Shippers' Association which is a co-operative concern. This is practically an express company and its only business is shipping fruit, mainly peaches, to Chicago. By a very satisfactory arrangement with the Pere Marquette railroad company the association assumes all of the responsibility of loading and unloading cars and collecting freight charges, the railroad furnishing the cars and doing the hauling for a certain rate per hundred pounds. The association has been carrying on this business for probably 15 years with general satisfaction to the growers until the last two years when the train service has been very unreliable and cars have not always been furnished. The Association furnishes the loader and the unloader and does the manifesting. Before this was organized the American Express company did the business and charged $6\frac{1}{2}$ cents for freight on a ten-pound basket. The Association at once reduced the rate to $3\frac{1}{2}$ cents and later to $2\frac{1}{2}$ cents per basket. Meanwhile it has accumulated money and has expended this to the extent of several thousand dollars in improving the highways leading to the station.

The central packing house is sometimes operated in a co-operative way and in some cases an individual or company organizes and runs the concern. In either case the business is ordinarily managed on a similar plan. Several growers engage to deliver their fruit, usually peaches, at a building which has been provided for the purpose on a railroad siding. The fruit is delivered in baskets or boxes just as it was gathered from the trees and a receipt is given for the quantity delivered. Each man's fruit is then graded and packed separately and the owner given credit for the number of packages of the several grades. The fruit then goes into a common lot and is loaded into cars and

sold and each contributor is paid his pro rata share after taking out expenses.

This system has a number of advantages. The work of packing is taken away from the farm and is usually a great relief in this way; the grading is more carefully done and the fruit commands a higher price because the quality is reliable; it is sold by a capable person who makes that his business and brings a higher price; packages are bought in quantities and a saving is effected in discounts; the fruit is loaded from the packing bench immediately into cars with the least possible handling and reaches its destination in much better condition on this account. The expense of selling is reduced to a minimum.

But the profit is better understood by a comparison with other methods of selling fruit. In the earlier days of selling fruit in Michigan it was the custom to consign the fruit almost entirely to commission houses in Chicago, thus making that city a general distributing center. The fruit for other parts of the country went through Chicago and paid a heavy tribute to the dealers there. Now, let us see what the expense of selling in this way is. Suppose that a bushel of peaches sold for \$1.00 there. The freight and cartage charges are 15 cents and commission 10 cents, making 25 cents which the commission merchant took out and returned 75 cents to the grower. If the basket was then reshipped to say Buffalo, N. Y., as was quite common, the charges would amount to nearly 35 cents more and the fruit would have to bring \$1.35 from a grocery in Buffalo in order to pay the Michigan grower 75 cents. This represents about the average of expense for distributing fruit outside of Chicago in this manner. But if the Buffalo buyer were to come to the Michigan grower to buy the fruit he would naturally argue that 75 cents would be about the market value of the fruit and the 25 cents that would otherwise have been taken out in Chicago would go into his pockets. The manager of the packing house understands these differences in markets and is able to profit by them.

But perhaps the description would not be complete without noticing some of the disadvantages of the system. One of the first is to find a competent manager. Men who are capable of selling goods usually can command a larger salary than fruit growers are willing to pay them. Then growers sometimes imagine that they are a little more capable of disposing of their own fruit than their manager in the packing house and so drop out of the deal. I have known this to occur. Then again orchards are short lived with some men. It has been said that there are two classes engaged in fruit production—those who

are fruit growers and those who grow fruit. Some of the latter class sometimes lose their orchards and I have known of packing houses that have run very successfully a number of years being obliged to suspend business because the members did not produce fruit enough to keep it running. But when a sufficient quantity of peaches can be obtained within a convenient distance from the packing house this system is recognized as an ideal one among growers.

Another very promising field for general co-operation among growers as well as dealers who may be engaged in marketing fruit is in some measure that shall insure reliable packing. This will not only result in larger pecuniary returns but, what is of far greater moment, would raise the general moral status of society.

The large packers of fruit in California understand the value of reputation in marketing fruit and a package of fruit from there is always reliable. Fortunate would it be for the growers further east who pack fruit—or put it in packages at least—if as much could be said of them and their output. The greater part of the fruit may be honestly packed and yet if a buyer finds one that is not so put up he is suspicious of the next 20 that he buys. It is a matter worthy of the careful consideration of fruit growers if we may not properly co-operate with the League of Commission Merchants in their efforts towards securing such national legislation as shall insure full sized packages and honest and reliable packing.

FRUIT MARKETING AS VIEWED BY THE COMMISSION MERCHANT.

WM. L. LOEFFEL, Representing Barnett Bros., Chicago.

When asked to be present at the fruit-marketing session of your annual convention, and take part in its deliberations, I took it for granted that being a commission merchant, you expected me to treat this so important a subject from his standpoint.

There have preceded me in this discussion a president of one and a general manager of another fruit-growers' and shippers' association, also individual growers and shippers of prominence from various states, leaving very little that is pertinent to the subject for me to treat. Yet, mean is the commission merchant who, when a neglected article is entrusted to him for disposition,

does not find in it some redeeming quality to recommend it to a buyer and so affect a sale; so with your indulgence I hope to thresh some valuable grains out of this already so thoroughly threshed subject.

From time immemorial has fruit-marketing agitated the minds of men. It is an occupation that has been engaged in from the beginning of humankind: and it is a disputed point (one to which brother Louis Erb of Cedar Gap, Missouri, has given considerable thought and study), viz: "Whether it was the serpent in the Garden of Eden or Mother Eve that first engaged in fruit-marketing." Certain it is there are still plenty of Adams ever ready to take from the hand of Beauty the fruits of mother earth.

Fruit-marketing may be defined as bringing to a place or places especially designated for that purpose the products of farm, garden or orchard, there to barter them for some other article or articles wanted, or to accept for them a specified quantity of a recognized medium of exchange. These specially appointed places have been termed markets; and no matter what country's history one reads mention is made of its market places.

It was here that the producers themselves offered their products for sale, and as business in their market places continued throughout the entire day and night, it was often necessary to entrust the selling to a substitute, and these substitutes at first were either their wives or grown-up sons, latterly regularly appointed sales agents.

These substitutes devoted to selling all their energies and became adepts in the art. While the father, the grower, concentrating himself mind and body to producing and preparing the products for market, became expert in his line. Therefore, a close relationship exists between grower and commission merchant. Even today if you would take a census of the various commission merchants you would find that three-fifths of them were either growers at one time themselves, or are sons of growers or in some way related to them.

In times gone-by the fruit products of a community were seldom greater than its consuming capacity and whenever these were in excess they went to waste; only occasionally into by-products. Tropical fruits and even those grown in temperate zones were with few exceptions never seen in countries other than in those in which they were grown and then only on the tables of princes and the rich.

Lack of suitable transportation may be assigned as the reason for this. But as the means of transportation increased we see

at first the seaport cities only supplied with foreign products, then gradually the more inland towns.

For the advancement of the fruit interests there were pressed into service new discoveries and inventions as soon as made. Wherever fruit-products exceeded the local demand, there outlets were created and a demand elsewhere stimulated. Increased and improved transportation facilities were important factors in the development of the fruit industry; lack of these facilities or congestion in them will stifle or retard it.

Let us look at the more recent history of fruit growing and marketing. Many of us remember twenty and thirty years and even longer ago, that with much smaller crops than now, lower prices prevailed. Causes were excessive concentration at local markets, and lack of distribution. Realizing this those who were entrusted with the disposal of these products—viz. the commission merchants—rose to the occasion, thoroughly canvassed not only their immediate neighborhoods but also the distant cities and the foreign markets. They ascertained their wants and supplied them. The overstocked markets were relieved, the excess advantageously disposed of, a higher standard of prices established, and the growing of fruits and vegetables made more profitable. A satisfactory working arrangement existed between grower and commission merchant which was productive of all these results. And as long as these relations continued to be satisfactory, complaints were few.

Production increased until it was conducted on an enormous scale and in spite of set backs either on account of imperfect or inadequate transportation, or loss incidental to the perishable nature of the goods themselves, paying prices were maintained.

But these conditions could not last forever, and there came the demon of distrust and discontent. The harmonious working relations existing between grower and commission merchants were either severed or greatly strained. The grower was led to begrudge the selling agent his legitimate compensation and he in consequence took steps to reduce the percentage of commission allowed for his services, just as though ten per cent. for fruit and five per cent. for selling produce is not an already very low compensation.

But many a grower did not stop there, he went further. True account sales rendered by able and reputable commission merchants, satisfied him no longer, he wanted more; and how did he go about to get more? He sent letters to commission merchants, reading about as follows: "I have divided my today's shipment between you and two or three others of your competitors. He who returns me most will in future receive my en-

ture shipments". Does any one here present believe that there is or ever has been any commission merchant who would take such letter seriously? Does it not show that such a grower or shipper as this one referred to, had absolutely no confidence in any of the merchants he proposed to patronize? Was it not his aim to put commission merchant against commission merchant, with a view of receiving more than his goods actually sold for? What wonder then that some crafty or unscrupulous commission merchant (and there are black sheep in every fold), perceiving the gullible nature of such a shipper, should take steps to systematically exploit him? And how did he go about to accomplish his end? For a few days he rendered account of sales at higher prices than the goods actually sold for, and although the shipper knew better, in nine cases out of ten, he entrusted the bulk of his shipments to such a baiter.

Yes, the fish was landed! And then what awful cries of "Thievery" were there not heard about the dishonesty of the commission merchant. And how did these cries not reverberate from one end of the country to the other?

This is all ancient history and repeated every season. I wish by no means to justify the course pursued by the crafty commission merchant referred to, although it was a course called forth by the action of the shipper himself. Reputable commission merchants condemn such acts, discountenance and expose them whenever they can.

But if growers proceed in the manner referred to above, what incentive is there for the commission merchant to advertise the commodities entrusted to him, to thoroughly distribute and advantageously dispose of them, if his compensation be reduced below the cost of handling and his supply a source of continual uncertainty?

I seem now to hear somebody say: "There need not be an uncertainty of supply; commission merchants can remove the uncertainty by buying at producing points." Yes, that is so. But by so doing does not the commission merchant change the nature of his business, does he not cease to be a commission merchant, the agent of the growers?

Being of an accommodating nature, many an erstwhile commission merchant makes this change in his business and becomes a dealer pure and simple. Let us follow him in his new business. He lets it be known that he is ready to make purchases f. o. b. at producing points. On the supposition that all goods offered at producing points are graded and packed according to specified and established rules, he orders as large a supply as he thinks his trade and market will stand, wires even

the money to many a salesagent of shipping associations. And his cars ordered are shipped and they are rolling. Not having taken his neighbor into his confidence, the latter who was similarly metamorphosed from commission merchant to a dealer, orders likewise; and so does another neighbor and still another and another.

The steadfast commission merchant, however, remains not idle, he wires his market quotations to producing points, shipping simultaneously; and solicits shipments as he always did. Those localities which had not been favored with orders, and others which had more products to ship than they had orders for, will consign their unsold commodities to the merchant soliciting them; and there are then rolling to the one objective market bought and consigned goods in quantities greatly in excess of the demand. What the consequences will be can be better imagined than described. Over-supply, decline in the market, and general demoralization. And this state of affairs especially if it has taken place on a principal market will be quickly reflected at the producing points; orders will be countermanded and the prices will decline sometimes fifty and seventy-five per cent.

As an example: During last year's shipping season of peaches at Texas points, \$1.00 per crate was the price on Monday; 50 cents to 35 cents on Wednesday, Thursday and Friday. It is one of those unsatisfactory conditions against which both grower and commission merchant are raising a cry of complaint. The buyer will only purchase when he has a sure profit in sight, and abstains from buying when the results are doubtful, and since many a community cannot sell all or only a part of its products, what is it going to do with that portion of its products remaining unsold? Leave them to rot because there are no f. o. b. buyers? "We want to sell no matter at how low a price," is the cry. Will this cry not invite the monopolist of untold financial resources or a consolidation of speculators of means to buy and sell the entire crop at its own figures, similar to the Beef trust or any other trust? When analyzed thoroughly has not the inordinate f. o. b. selling craze proven to be the parent of trusts?

This is the picture of f. o. b. selling with the supposition that grading, packing and loading has been done honestly and by experts. But at how many producing points is this the case? It is and remains only a supposition; facts at any of the shipping points prove the contrary. Did not every merchant who had made purchases of peaches, tomatoes and potatoes, f. o. b. Texas or any southern point last year, lose heavily? Not because the

markets on which their purchases were disposed of were low, but primarily because the packing and the grading were poor and dishonest.

This state of affairs did not exist in extremely southern points only, Michigan, Illinois and many other producing points presented similar conditions. Benton Harbor has a large local market. Some goods are stuffed, I dare say, just to sell without any regard for the rights of the buyer. Consequently the complaints of the consumers who purchase Michigan fruit in original packages are loud and many. Have they not found, for instance, in their baskets of peaches a few large ones on the top and trash and culls in the center and bottom? Does not all this tend to bring the fruit traffic into disrepute? And although the grower and packer is the sinner here, the commission merchant receives the blame and as a rule must make good the loss to his customer who bought in good faith.

Having alluded to the causes that have either directly or indirectly contributed to the unsatisfactory manner in which fruit is and has been marketed, the next question arising is: "Can these causes be removed and can the enormous crops now grown be satisfactorily disposed of?" I for one most emphatically say: Yes, these enormous crops can be handled advantageously, yielding a profit to the grower, a living to the selling agent, and a blessing to the community. We have considered some causes of complaint, some abuses; each and every one by inference can suggest the remedy, and we will revert to only a few requirements that will make fruit marketing what it ought to be.

A first requisite will be, careful harvesting, proper grading, honest and expert packing, and suitable packages. The necessity of all these is apparent. But the subject, grading, packing and packages, has been so often and so ably treated, that I will not waste very many words on it. Permit me only to ask that this society in convention assembled, co-operate with the legislative committee of the National League of Commission Merchants by passing a resolution favoring a national law regulating fruit packing and packages, and then assist as much as is in its power through its members, representatives and senators at Washington to have the law passed.

The second requisite is the proper disposition of culls and second class fruit products, and such fruit products as arrive on the market in bad condition. The importance of this consideration is apparent to every thinking fruit grower and shipper. Eliminate from the market the culls, dispose in some satisfactory manner of the second grades and also of those

strictly No. 1 grades which for some cause or other reach destination in poor condition and you will create a healthy and satisfactory market. The culls should be kept at home, be fed to the hogs, provided the grower can do nothing better with them. The second grades when crops are heavy and those that reach the market in bad condition should go into by-products. And I would advocate the erection at centrally located points of conserving establishments that can convert these into jellies, syrups, dried, preserved or any other by-products.

The third requisite, intelligent and honest distribution. With culls, second grade, and goods in poor condition, removed from the market it is apparent that No. 1 fruit no matter of what variety, will bring as much and more money than if all the three grades were offered together. But the quantity will be still large, and judicious distribution and proper handling by able and conscientious commission merchants will be a necessity.

Distribution theoretically is an easy proposition. Forward to each market only what it can handle to advantage at a satisfactory price. If congestion is imminent instruct your representative to consign to other centers any surplus which you may control. A practical illustration may be best on this point:

Our house has for a number of years represented on the Chicago market, shipping associations located in Texas, Alabama and Georgia, all located in or near the 32°N. latitude, growing similar commodities and shipping about the same time. Let us take peaches for example. With the exception of a few cars, our Texas connections send all of their peaches to us in Chicago. These we sell on the Chicago market provided the Chicago market is satisfactory—if not, we reconsign them to either Milwaukee, Madison, St. Paul, Minneapolis, Duluth, Grand Rapids, Detroit, Toronto, Buffalo, Toledo, Cleveland, Columbus, Pittsburg, or any other available market. We proceed similarly with shipments of peaches from Mississippi, Alabama and Georgia. The markets to which we reconsign act similarly in case of an oversupply. The result has invariably been satisfactory prices for the grower.

This thorough distribution prevents congestion on any one particular market, and assures the very best prices obtainable for the commodities shipped from any producing point. Here it is hardly necessary to mention that the commission merchants so selected in the markets must be men of tried ability, integrity and experience.

A fourth requisite, the disposition of the excess of the No. 1 fruit, after thorough distribution has reached its limit. If such fruit consists of strawberries, peaches, pineapples, tomatoes and

similar varieties, they should go into by-products, and the conserving establishment above referred to should be made use of. But such commodities as apples, pears, some varieties of peaches, also potatoes, cabbage and the like, on which the time of consumption can be extended, may be placed in cold or common storage for a longer or shorter time, as the nature of the commodities or the market may require.

We have considered satisfactory fruit marketing and elimination of everything that by experience has proven disastrous to it. We treated specific requisites, proper grading of fruit, the disposition of culls and second grade articles, proper method of distribution of first grades, disposition of the excess of No. 1 products after intelligent distribution had supplied the available markets, storage plants, and by-products: all the necessary qualities of the men who should be connected with the various branches of fruit marketing.

The honest, able, and up-to-date commission merchant having made a study of marketing and distributing knows better what to do under continually changing conditions and what methods to pursue in order to obtain the best results. Many a grower, who thought he knew all about fruit marketing when he went to the city, and tried to teach his commission merchant a lesson usually went home wiser and better instructed.

The commission merchants among themselves have been instrumental in bringing about many reforms in the methods and facilities of transportation. They have fought hard and assiduously for the reduction of excessive express, freight and refrigerator charges; they are the truest allies the growers and shippers have.

The average commission merchant is intelligent, up-to-date, able, and honest as he should be. And why should he be otherwise? Is he not the descendant, the relative, the agent of the grower? And the grower can depend upon it that the commission merchant who possesses his confidence will perform his duties well and conscientiously. Yet there are exceptions to every rule, and I do not deny that there have been commission merchants who were not true to their trusts. If you entrust to the worthy, and those are easy to find, the handling of your own crop and that of your entire locality you will find him a good distributor and an able representative, and he will bring you as a rule larger net returns than if you yourselves attempted to perform his duties. Note the admirable manner in which the Wisconsin, the Cape Cod and Jersey cranberries have been handled; the Rocky Ford cantaloupes, and many other commodities from different sections.

While the commission merchant is ever on the alert for anything that may improve the fruit industry, he realizes that the fundamental principles for the regulation of prices are supply and demand. He realizes that proper distribution prevents congestion, and organization is conducive to success and in the co-operation the commission merchant is a co-worker and not an antagonist.

He as much as any other respects and observes the law of mine and thine, and that justice will be meted out to every one according to his deserts, and he makes confession in the same country faith to which his fathers paid homage, and so nobly sung by Norman Gale:

Here in the country's heart
Where the grass is green
Life is the same sweet life
As it e'er hath been.

Trust in God still lives
And the bell at morn
Floats with the thought of God
O'er the rising corn.

God comes down in the rain
And the crop grows tall;
This is the country faith
And the best of all!

WHAT THE EXPRESS COMPANY CAN DO FOR THE FRUIT SHIPPER.

C. O. STIMSON,

Agent American Express Co., Baraboo, Wisconsin.

It has been said that the fruit business is a lottery. If this be so the express company should be taken in custody for it is the means of carrying it on. However disposed of, the transportation company generally shares in the profits.

The public generally does not realize that the daily business transacted by an express company amounts to any more than the ordinary undertaking for shipment of the package of necessity brought to its door, or perhaps the sale of the ever convenient money order at a nominal fee payable anywhere,

But the business man or the farmer or whosoever comes in direct contact with these incorporations sooner or later learns that various transactions can be performed among which is forwarding money by telegraph, collecting notes or accounts, redeeming articles pawned, purchasing train stop tickets or berths and last but not least the purchase or sale of all kinds of commodities anywhere.

It is in this connection that my subject brings me. Perhaps the farmer or the storekeeper desires to obtain an article which is unobtainable locally. He may not have the time for correspondence or the inclination to go to the necessary trouble of ordering from some distant city or perhaps the knowledge as to just where it may be bought.

He communicates with the express agent, tells him his troubles and it is all over. The agent takes his order, often a sample of goods accompanying and forwards same by the fastest express trains to representative at point designated. The representative receiving the order uses his own personal judgment in the selection and purchase of the article desired, forwarding it by first express or stating reasons of delay. For this service the company receives nothing but the usual charge for carrying.

To aid in the purchase of commodities likely to be desired at some distant point, some express companies have adopted a list of such articles stating at what points they may be obtained and price. This list contains such articles as butter, eggs, cheese, honey, poultry and also all kinds of fruit as well as many other articles. Then perhaps this same individual may have some article of manufacture or produce for which he desires a market. He may have had past experience and be familiar with some reliable firm who will gladly take care of his shipment on receipt and dispose of it at market price charging the usual commission, but whether or not such is the case it is the business of the express company to take this shipment to the most likely market and dispose of same as if it were their own to the best possible advantage.

If there are reliable commission firms represented at point of shipment the commodity is generally turned over to that one best suited to make the sale at market price, who in turn disposes of shipment for account of shipper.

In some of the larger cities returns are now made direct to shipper by approval of company delivering, in this manner saving any possible delay as well as insuring just and true returns.

In order that agents may keep better posted some express

companies publish a complete market report in the large cities, a copy of which is furnished each office requesting it almost daily, thereby enabling them to designate the best market.

Of course where there are no commission firms represented and consignments are made they are either sold directly to the dealers or left with them in some instances to sell for account of company and sometimes even in small towns are sold direct to the consumer. For these services the express company receives only its usual charge for transportation.

Better than this manner of marketing the article, it may be placed on the list of salable commodities, or quotations forwarded to likely points with the view of securing orders. In these ways many tons of produce such as butter, eggs, poultry, veal, honey, vegetables and last but not least, fruit, are disposed of yearly at a very satisfactory and encouraging price.

This branch of the express business is appropriately named the Order and Commission Department. It is a friend to the merchant and the farmer and consequently the fruit shipper. I dare say it is the best friend the fruit grower has, for it not only helps to find the best market but it stands between the grower and monopoly. They can use it as a hammer to hold over the buyer's heads to force them to give fair prices. I have known of cases where solicitors congregated and were never known to buy at all until the grower used the express company as an outlet for shipments, when they were glad to pay often exorbitant prices in order to compete.

There is no class of produce more difficult to handle or that requires more study in the marketing of same than small fruit. From the time the fruit is ready for shipment till the last of it has vanished the successful grower must keep constantly on the alert in order that he may secure the best possible prices which are governed by the supply and demand. Nor is there anything in which there is such chances of loss, for today it is here and tomorrow it is gone. Thus it can readily be seen how the express company with its representative in every town can be of great help to the grower in marketing, if the work is carried on consistently by all concerned. There are many ways in which they may render their assistance but perhaps the most important is their aid in finding the best possible markets.

In the past the greater share of the growers have relied on the commission firms in the large cities to dispose of their fruit, making consignment after consignment, knowing little about the market, being content with what was received. Of course if he is dealing with a reliable firm, and there are many, he

will receive all they can obtain, deducting the usual commission and express charges. But perchance should he be induced to consign to some unreliable firm he will be a heavy loser sooner or later. As the supply is consumed by the public everywhere, their profits if they were unable to sell locally, must be obtained either directly from the commission firms who must make their profits direct from the grower.

Many growers begin to realize the fact that the consumer prefers to obtain his fruit direct from the grower, thereby obtaining fresh stock at lowest prices and spend considerable time just previous to the opening of the season corresponding with reliable dealers at points prospective and secure many valued orders lasting sometimes throughout the season at encouraging prices. However, the result sometimes is that although the customer is reliable, the fruit arrives in poor condition or market gets overstocked, there is a loss and in the end there is a tendency to make a complaint and the shipper is entirely at the mercy of the dealer who makes a liberal reduction and settlement is made.

The express company quotes prices, using blanks printed for that purpose which are forwarded to its agents at all prospective points. On these quotations blanks instructions are given them to either call on all reliable dealers or notify them of prices quoted and secure their standing of a trial order at least and forward to office, quoting to be filled by first express. As all orders have the personal attention of the agent at shipping point who sees that they are filled by reliable growers with choicest stock, dealers are not so reluctant in placing their orders. Moreover as agents at small towns work on commission receiving a percentage of the express charges on goods both forwarded and received and as agents at larger points must make a perceptible showing in order to hold their position, it can be readily seen that it is to their interest to not only secure these orders but also to give entire satisfaction, for without it the orders are lost.

The agent also has an opportunity to inspect the fruit on receipt, settle any complaints and regulate future orders. Many a man in this position looks forward to the fruit season and reaps quite a harvest from the nice business done. As the season advances every change that takes place in the market is transmitted to them by distributing office, thereby enabling them to keep posted and when favorable prices permits perhaps secure further or increased orders from interested parties. In fact the express company is a slave to the fruit grower, ever

ready to attend to his every want; not only taking care of his correspondence but even keeping his accounts if necessary.

Perchance should he for any reason at the end of the season have any account open for collection, here too the express company is in an excellent position to be of service. The representative of the company can corroborate the statement of shipments by his records, convince consignee of just dues and for a small fee if account is sent through the collection department, will often be successful in collecting when all other plans fail. If all fruit could be disposed of in the manner just outlined, and it seems it might be, except perhaps in case of an overwhelming crop, with the co-operation of important shipping points, it is quite apparent that better results would be obtained both for the shipper and for the dealer, the shipper receiving better prices for his fruit at a known figure and the dealer receiving his supply fresh from the grower just as desired.

In case of the overwhelming crop there are many methods of disposition which at the present time are generally resorted to. Some may be consigned to the commission merchant, while some may be disposed of for cash to the speculator, but here again comes the Order and Commission Department of the express company to the fruit growers relief. We know that the commission merchant sometimes consigns shipments to likely dealers throughout the country, giving them instructions to dispose of to best advantage for account of shipper. Why not we and save this middleman's profit?

With this end in view the express company governed by past experience by correspondence and by information obtained from lists of officers furnished, containing names of dealers in the respective towns, and number of packages of each kind of fruit each dealer can ordinarily dispose of to good advantage, is in a fair condition to designate a prospective merchant, forwarding to each agent just the amount he should be able to dispose of charging the usual low rate for the services. A bill of the shipment is forwarded with it, with instructions thereon, requesting that sale be made at billing price, which price is governed by the market if possible, otherwise at best price obtainable.

Where there is a commission firm represented at point of shipment, although it has been found that generally it is not policy to consign to such points except in the large cities, on account of market being generally well supplied by them, fruit is generally delivered to them to sell for our account, unless there is reason to believe that proper attention is not given

shipments as it is not policy to antagonize these firms by selling to their customers. It is the smaller towns in general where success in this method is the best, sometimes a very small one as it were. It stands to reason that it is the supply and demand that governs the prices obtained. Quite often orders are received especially throughout the west from very insignificant towns for large shipments, followed later by similar orders and it is found on investigation that some agent has secured the orders from some inland towns whose people are glad to obtain it at any price. Then again it may be some dealer who has taken the orders from the farmers, who come for miles across the prairie to trade at the little country store. But do not think that all is golden in these ventures for it is not. You have all kinds of men to deal with as in any other business of disposing of your fruit. However, you have the express company back of the dealings and it is to their interest that every effort be made to secure the best possible prices and forward true and prompt returns and if justice is not done they are soon found out for their officials are generally on the alert and do not have to visit an office many times to discover the interest taken in this great work.

Generally the natural supposition on receipt of a poor sale is that shipment has been slaughtered, whether consigned to the ordinary commission house or through the Order and Commission Department of the express company. No matter what the conditions are the seller is invariably to blame. Quite often it is the small inexperienced shipper who makes these accusations, the experienced man never making a complaint as he knows what to expect. They little realize the conditions at time of shipment. Perhaps the weather is hot and sultry and fruit is overripe and soft or possibly on arrival at destination, market has become overstocked.

If complaints are followed up vigorously a large per cent of cases are satisfactorily explained. Do you ever hear of these complaints when conditions are reversed? Still quite often the fact is only too true. Moreover it is the agent's own personal interest that satisfactory returns are made, not only to increase his revenue but in order to hold his position. Many an agent has been severely reprimanded and no few removed on account of lack of interest in this branch of the express business.

Sometimes the correspondence department of the express company renders valuable assistance to the marketing of fruit. We all realize that holidays and Sundays, although we like to see them come, are drawbacks to the fruit question, especially in the case of berries. How easy it is for the express company

to drop a card to each agent on its line soliciting orders that may be filled for the holiday on account of some demand on that date or for Sunday at points having restaurants and hotels desiring fresh fruit. In this way large quantities are satisfactorily disposed of yearly.

If the conditions are favorable, weather is cool and fruit in good shipping condition, fine results have been obtained by consigning to far distant points for Monday's arrival, thereby these towns receiving fruit early Monday when ordinarily it would not be received until later and is in good demand. However, experience has taught that it is poor policy to make these shipments when conditions are unfavorable, weather is hot and fruit is soft. In fact these are conditions that should be guarded against in all consignments by express.

Further than the marketing of fruit the express company has an all important duty to perform in the transportation of same in order to deliver it at destination in first class condition. With this end in view it is the companies' aim that shipments be handled with extra care, but it is quite often the case that this is not or *cannot* be done, on account of lack of time or room to work.

I recall many instances where trains have left stations before shipments were loaded although every effort was being made to load cases and those that were so hurriedly loaded were in about as bad condition as those delayed, which perhaps may spoil before destination is reached.

If the railway companies undertake to carry express matter, why should they not be compelled to hold their trains until especially perishable express matter be loaded as well as their passengers, mail and baggage?

Quite frequently the express company at important shipping points where the business will permit, have been successful in securing extra express cars set out in a convenient place to be loaded and picked up by regular shipping trains. This plan is very convenient as well as profitable to the growers for they are able to load direct from their wagons in a careful manner, saving necessary handling when loaded in ordinary manner. Then, too, they have the refrigerator fruit cars which are carried on passenger trains and may readily be secured if desired for carload shipments.

These are generally put in service for far distant shipments and may be seen daily in the spring time transporting the southern fruit to the north as the southern grower finds them a necessity. Still more might be accomplished by the express company in aid of the fruit grower, for this work is just in its

infancy, such as the personal solicitation of orders at prospective points by some representative of the express company employed for that purpose. Also the collection of each bill of fruit ordered through the company by the agent on receipt at destination.

There is no doubt that all employees have their time taken up almost exclusively with their daily duties, while a special representative could do much by constantly laboring with the dealers in securing orders.

Another manner in which the service might perhaps be bettered is by some official of the company visiting transfer points and making thorough examinations as to the manner fruit is handled. I dare say he would find some carelessness which should and must be remedied. There are many other ways that the fruit grower could be benefited which of course require a vast amount of labor in order to bring about.

Experience is a dear teacher but this and careful study is the means of pointing out the defects in any undertaking. With this thought in mind let us work together to better the service when possible, conferring with those having power, as the interest of the fruit grower along this line is the interest of the express company, for if we serve them they serve us in return.

THURSDAY—AFTERNOON SESSION.

The President: This morning we had several very excellent papers on fruit marketing, but we did not have time for discussion. It seems too bad to pass those up without an opportunity for at least a little discussion and if any one has any remarks to make and will make them sharp, short and pointed, we are ready to listen to any one on these topics.

Mr. Hanchett: There are a few things that I thought ought to come into our report in connection with the paper presented by our friend, Mr. Stimson, who represented the express company. In planning this marketing session, I see your secretary has been perfectly fair and has invited in not only the fruit grower, but the express company and the commission man. What I refer to is in regard to the order and commission department of the express company. Of course Mr. Stimson has presented the express company's side of it, and I think that there ought to be something of a discussion in regard to it by

the fruit growers present. We have been making something of a study of that matter up at Sparta. Of course as growers we are anxious to market our fruit in the way which would bring us the greatest returns. We have had a feeling very often that marketing them through the order and commission department of the express company was not a businesslike way of marketing our fruit. In talking on this subject with leading men of other fruit associations, I find that most fruit associations are opposed to this method of marketing fruit, and it will probably be of interest to fruit growers generally to know that there is a controversy on at the present time between the Western Fruit Jobbers' Association and the express companies in regard to this order and commission business. It looks as though there might be a storm gathering which will have to be fought out. Now, while we realize that the express company can dispose of fruit sometimes, to good advantage in limited quantities, I feel that the indiscriminate use of this order and commission department is very unbusinesslike in the extreme. Our manager, in this past year, has kept careful record of the order and commission business done by our association in comparison with the other business done and I would like to call on Mr. Richardson to give a report of that comparison to this meeting.

Mr. E. A. Richardson: In our work this year we had to keep track and make an account of every case that was turned over to the manager and a great many of our growers who had always been shipping through the order and commission department of the express companies felt as though they did not like to cut that out, so at the end of the season, when the season was over and they had received their money, we made a tabulated statement of the prices received every day, which we had to do in order to get our average, also the prices received from other departments and shipping through the express company order and commission department. I will give you a brief summary of a part of the statement as I made it out. On June 7th, we shipped 4 cases of grade "A" strawberries through the order and commission department of the express company which netted \$1.78. On that same day we shipped also 16 cases—while there were 16 cases, only about half of them, there were 9 cases that were shipped to other parties, but part of them were lost in transit, so the total average on that day was \$1.32. So you see there was quite a percentage in favor of the order and commission on that day, the total average includes an average that we received from the order and commission. Then following from that day, the next day we shipped 21 cases which averaged \$1.70 a case through the order and commission and our

general average on that day was \$1.89. On June 9th, 7 cases, averaged \$1.60 through the O. & C. and \$1.91 was our total average. June 11th we shipped 88 cases through the express, averaging \$1.42, and our total average was \$1.63. June 12th, we shipped 43 through the express company, averaging \$1.33, total average, \$1.64. June 14th, 3 cases, \$1.79, total average, \$1.78. The O. & C. had the advantage that day of one cent. June 15th, — cases, \$1.49, total average, \$1.78. June 18th, \$1.32 against \$1.41. June 20th, \$1.22 against \$1.51. June 25th, 11 cases, averaged \$1.33, through the express, and \$1.16 was our general average. June 25th we shipped 124 cases, we only shipped 11 cases that day through O. & C. June 26th, we shipped 31 cases averaging \$1.32 through the O. & C. and \$1.06 was our general average. June 26th, our season is running along toward its last, we shipped on that day 610 cases. That completed the shipments for that grade through the O. & C. department this year. We also shipped red raspberries, black raspberries and blackberries which ran on about the same average, there is anywhere from 5 to 25 cents in favor of our general total average over the express company's O. & C. shipments. I have the statement here, but it is useless to repeat it at this time, unless called for. We feel now that we have demonstrated to your satisfaction that we can make more money by shipping the stuff ourselves, finding our own market, than we could to peddle it through the express company and letting them hunt the market for us.

Mr. Daub: In 1904 our association decided to take up the matter of disposing of the crop through the express company's order and commission department, and they were almost unanimous in favor of the method, excepting the speaker and he said "Gentlemen, we can not do it, it will be a failure," and I left them and I went and hunted up my own market and it proved to be a failure before they fairly got started. They sold some of them at a fairly good price, but it was an utter failure, when they could receive for their berries upward of one dollar, they received only 65 to 70 cents, the whole market was glutted and they could not do anything. At that time I was right at Duluth at the commission firm's office when they received a message from the secretary asking if they could not make some arrangement and we took up our old method again. It was against the grain of every one of those members, but they tried it and conceded that it was a failure, it was the wrong policy to pursue, our advantages are all on the side of freight and refrigerating and I should advise any one never to try that plan. Where they have to be transferred I use the express company at times when

I have to do it and it is the best method there is, but don't under any circumstances endorse that method where you can have refrigerating freight service.

Mr. Hanchett: I think we have an illustration of the dangers in this manner of marketing fruit. Sparta and Eau Claire are the leading fruit centers of Western Wisconsin. If the express company is allowed to do an indiscriminate order and commission business west, the agent at Eau Claire and Sparta would be shipping into the same towns at the same time without the proper knowledge of what the other officer is doing. We find towns handling and selling ten cases of strawberries getting twenty cases. Now, Sparta and Eau Claire are not the whole of it, there are plenty of other stations shipping fruit, not on so large a scale, but supposing that we are doing this order and commission business, what would be the result? The market would be completely slaughtered. We found this, that we came into competition in South Dakota and Southern Minnesota with Blair, in Nebraska. The prices which the dealers told us they could get blackberries from Blair, Nebraska, were the same on 24-quart crates that we were asking on 24-pint crates. We did not quite understand the situation, but it was my pleasure to be in Blair, Nebraska, some time ago, and I called on the leading firm, McCormick & Kuthman and it seemed that they were shipping the entire fruit crop at that point and they had been doing it through the order and commission business. I asked Mr. Kuthman if he considered it satisfactory, and he said no, they would not do any more of it in the future. This is pretty generally the sentiment that I have found in communities where fruit growers wish to do their business in a businesslike way. There is this about it, at a fruit center that has built up a business in a businesslike way, we can spend our money advertising and building up a market, we can work at it for years and the express company will accept the fruit of a lot of ignorant men who simply know how to raise it, they will destroy us in one week, we will be stripped of all the fruit of our labor for years almost instantly by that manner of doing business. That is the reason why I did not want the paper presented by the express representative to go into our report without being challenged somewhat.

Mr. M. S. Kellogg: I take issue with our good friend from Sparta in saying that these poor ignorant fellows know how to grow strawberries; they have not learned the first principles of growing strawberries if they take the express companies as a means to take care of their strawberries. Sometimes they find it necessary to send a few cases off through the express com-

pany, that method has been tried up through our section by some growers, but never has it given equal returns to what the local market would have done with an equal amount of intelligence and brains used in marketing fruit on the local market. Another matter in connection with handling the business by express that is of no small importance is the fact that if a man is known in his locality and ships in many berries, he can secure any accommodations from his local express agent and the local express employes. There is no question about that, but the trouble comes on with the men, not those who load the cleated crates, but the men who receive them. I speak from experience, as I have seen berries loaded on express trains at Janesville, when the express agent would throw the crates anywhere from eight inches to two feet to get them into the position that he wanted them in and any attempt to remonstrate with him was met by either insulting remarks or a slight invitation to go somewhere else and mind your own business. I know that complaints have been sent in to headquarters for this cause and that man found his job entirely gone or he has been transferred to some other run, and I think these matters are such as the fruit growers are interested in and the express companies ought to be interested in.

Mr. Daub: I want to make one exception, and that is blueberries, you can ship and handle blueberries, but strawberries are out of the question.

Mr. Richardson: In handling fruits we send out a great many orders for blueberries and we ship quite a few and some of our members, when we got to the crop of blueberries they drew away from them, and the fact was, we had to go on the market and buy the blueberries, so we bought quite a good many and got orders and what we did not get orders for we sent on to commission houses and we send a few of those berries, just the same, on order and commission and we invariably got left on them. Our blueberries averaged \$1.63 per case of 16 quarts.

Mr. Loeffel: This is a very important discussion. The express companies have done in their time a great deal of good and after listening to that paper this morning, they propose to do a great deal more good; all that is in consideration of you people paying to them express charges, they are going to act as your correspondents, they are going to act as your distributors, they are going to act as your commission merchants wherever you want them to act and they are going to prevent the creation of a large and gigantic trust that might in the course of time entirely beat or rob the poor growers out of the saving that they may realize out of their goods. Now, I think such a boon as

an express company ought not to be talked against, as you have been doing. At the same time, there are things that we ought to ask the express company to do, and continue to do and to do that properly. There have been complaints about conveying berries from one station to another, the berries were in good condition at the time they were delivered to the express company, but they were poor at the other end of the line. Now, would it not be nice on the part of the express company if instead of doing all these various things they would handle those berries nicely and deliver them to their destination in good condition? Another thing, if instead of going and being such a great benefactor to the growers they would revise in some instances their rates a little bit better, then the growers would be justified in attending to their own correspondence, they would be justified in attending to their own placing of orders and would be even in a position to give a man that tries to make a living honestly at some principal point a little profit for filling his order or disposing of the goods that they may entrust to him. Now, express companies have been, by the Interstate Commerce Act recently passed, created a common carrier. As a common carrier they ought to do their business properly and rightly and ought to be satisfied with being a common carrier, but if they are a common carrier and if they monopolize the fast transportation that the railroad companies can give, that is the transportation on passenger trains, they ought not to enter and become a competitor for a legitimate business that has long been established in this country. Let them continue as a common carrier and let their rates be just, let them do that. They try to tell us of so much that they are going to do and the very thing that they ought to do they do not do properly. I know there are some of the express agents that are just as conscientious as any one. Mr. Taylor, of the American Express Company, is a good friend of mine, and he realizes that in transportation a great deal of work has to be done. He succeeded through refrigerator cars from Louisiana points and Mississippi to have berries come to Chicago nicely. I give credit to Mr. Taylor for his effort, he has done a great deal, so that we may have a through service from Florida to a northern point. These goods formerly were loaded in Florida, transferred from one train to another in transit and when dumped on the Chicago market were hardly recognizable and although they were grown in the winter time when fruit was high, they did not pay. This morning we heard a man say that he approved of specialism, that the Lord came to redeem the world, now He came with one special object, to redeem the world.

Now, let the express companies do that one specific thing for which they are here and not encroach on the banker's business and on the merchant's business and also be a common carrier.

YEAR'S REVIEW.

By A. C. BENNETT.

From Report of Wisconsin State Cranberry Growers' Association.

In reviewing the events of the past year we must all realize that a new leaf has been turned over. A new mile stone has been passed. That a new history in the cranberry industry is being put on the stage. Old things are passing away, behold all things are new. Cranberries have become a cash article at last and to remain so forever.

Under the leadership of experienced salesmen in limited numbers the crop of Wisconsin cranberries has been more evenly distributed than ever before.

Through the united efforts of A. U. Chaney and the Wisconsin Cranberry Sales Company, we have secured in the name of the Wisconsin Cranberry Sales Co. a reduction in railroad rates to California of \$40 on every car of 200 barrels.

\$72 for every car to all northern Pacific points.

\$60 per car to Winnepeg.

\$12 per car to Minneapolis.

\$24 per car to Milwaukee and Chicago.

This means so many extra dollars in the pockets of Wisconsin growers. It also means a vast territory opened up to us in which we had never before been able to sell our Wisconsin berries. When we get low rates to Chicago it means that we get Chicago rates from there to a vast territory thickly populated and rolling in wealth whose appetites have longed for years for a taste of Wisconsin berries but owing to railroad rates they had to accept of eastern berries entirely. Now they have had a taste of Wisconsin berries and say they like them.

Our berries have gone east to Grand Rapids, Mich., and to Terra Haute, Indiana, northwest to Winnepeg and southwest to Dallas, Texas, and all along the Pacific coast, Los Angeles, Seattle, Tacoma, etc. Our last and best sale or highest price was obtained in Kansas, where our competitors advertised us the most.

What more could we ask?

By our contract with A. U. Chaney Co., they were placed under \$50,000 bonds to the Sales Company to sell the association berries in the open markets for the best obtainable market price to sell them in accordance to the laws of the states where sold, and of the United States; and that they should not enter into any combination with any other parties in violation of such laws and that as fast as the berries are sold that a duplicate bill shall be forwarded to the secretary of our association all of which has been faithfully performed to the letter. A. U. Chaney Co. were to do the collecting, advertising, telegraphing, remitting and bear all expenses of selling and receive five per cent. of the net returns at our shipping point and not five per cent. on the gross sales including freight, cartage, and exchange, as other commission men always do. This item alone saved the association over \$2,000; add to this the saving in railroad freights an average of \$40 a car, amounting to \$6,400, which A. U. Chaney Co. and the association saved the growers by such reduction and added together, the growers have saved \$8,400 on these two items; add to this the increased price by reason of the enlarged territory in which to sell the berries which count it \$1.00 per barrel, makes a grand total of over \$42,000 saved to the Wisconsin growers. A. U. Chaney Co. sold for cash and promptly returned to each shipper by check or draft eighty per cent. of the collection. And by the contract they are also to settle the balance with the association whenever the board of directors require them to do so. Could we ask for anything better? Out of this 20 per cent.. we are to pay A. U. Chaney Co. five per cent., also pay them back the money advanced by them for labels and stamps and six per cent. interest, the necessary expenses of the association at this end such as inspection and officers. The association is to pay also back to each member the ten dollars advanced by them and replace it from the two percent. reserved for necessary expenses, the balance belongs to the growers. Under our revised contract there is no pooling nor any evasion of any laws and any fool of a politician that would turn us back to the ungodly thieves that used to slaughter our berries for the commission ought to go and hang himself.

One beauty of our Sales Co. is that different varieties can be shipped in the same car and different priced berries from \$4.00 to \$11.00 per barrel no matter who raises them, each barrel bears the number of the grower and as soon as they are loaded in the car the business of the grower ends at his own station.

In this way small lots can be shipped at car load rates and the

jobber get a variety in price and quality to suit his trade and in times of shortage on cars we know the volume of the business and the agent can order them ahead, otherwise we might have been till mid-winter shipping this year.

Owing to the larger territory to sell in and the thorough distribution of the fruit, avoiding over-loading any one market and without producing gluts and stagnation anywhere, A. U. Chaney Co. not only sold all the berries of the Wisconsin Sales Co. without the loss of a single dollar of bad accounts but also sold nearly 300 car loads of Cape Cod berries. In so doing he prevented them being piled up directly in our pathway and secured good prices for them as well as our own and our association today, though less than a year old, has a record of being the boss Cranberry Sales Co. of the world and best of all we have not had the least desire of evading any of the laws of the states or of the United States. Our aim has been from the first, to give everyone a square deal and to raise the standard of Wisconsin Cranberries, believing that the American people would approve our efforts and be willing to pay a fair price for a good article which they did and we appreciate it. We have labored under untold disadvantage this season with inadequate store-room, short on curing boxes, short on help, having to install many new cleaning and grading machines to be run by gasoline engines which often proved very balky in the hands of inexperienced men, sometimes short on cars, and lastly short on barrels but we are all alive yet and fully determined to improve the quality of our berries in every way possible and to be fully prepared another season to give our patrons the full worth of their money.

1. We need first of all inspectors that can devote fully ten hours every day in the "picking" and "packing" season to the exclusive business of inspecting, not only the berries, but the warehouses during the picking time and to insist on a free circulation of air in all cases while the berries are being cured.

2. To see to it that no berries be packed wet.

3. That some more definite rules be formed for sorting and grading.

4. That the inspectors be provided by state laws the same as the inspectors of lumber now are and having no interest in the article inspected by them.

Certain ones of our competitors seem to have been lying awake nights to devise some plan to break up this association from the first, but it can never be done by outside parties. If it is ever done, it will be done by traitors within our own ranks,

Christ in his little band of chosen disciples had one traitor but the record says that he went out and hanged himself.

We must expect some of our members to do the same thing but our Kansas competitor has not only hanged himself, but dug his own grave in advance just because we did not employ him. If we had done so at his own expense we would not have only lost all the reductions in freight rates, but we would have been paying him \$2,000 more in commissions on freight, cartage and exchange and would have been restricted to our old narrow limits to sell in, and of course would have been compelled to sell at lower rates, he would have been interested to have the railroads increase their rates and to ship them as far away as possible. Your board of directors would have been branded as a pack of fools if they had accepted his proposition. He bought berries, so I am told, in the east at \$5.50 per barrel and advertised to sell them at \$5 per barrel, and offered Wisconsin berries at \$7.25 per barrel to our customers for which he had paid \$7 per barrel. Another competitor bought some poor berries because they were cheap and advertised them at 35 cents per barrel less than our customers were getting. These scavengers do not scare us in the least. They are as necessary as the buzzards in the south that live on carrion. The association berries have all been sold at a better average price than outside parties obtained and collections were made without the loss of a single dollar on bad accounts and the growers received the benefit and this was done in the face of the fact that there was a very large crop of apples, estimated at 36 million barrels, and the most generous amounts of all other kinds of fruit all over the country and a big cranberry crop, all of which brought fair prices. Last year cranberries brought as high as \$24 a barrel but outsiders got the profit not the growers. What more could we ask in a year like this?

Year by year all kinds of fruit are being put up in better condition; in more attractive packages, shipped under more scientific management. All large dealers, even in the retail business, have their refrigerators and the fruit being kept cool from the grower to the consumer, avoids the necessity of forcing unsound fruit upon the consumers. Yet some will try to do it, and the present stagnation in the cranberry market has been produced by some eastern jobbers who bought a lot of cranberries in the dirt of some growers who did not belong to any association. These smart alecks that refuse to join any association that would compel them to put up good berries and think they are making more money, the more poor berries they put in, are

deceiving themselves and blind to their own interests. If only good sound berries had been put on the market the market price would have continued firm at good prices until all were sold, but a small amount of slush put on the market at a low price soon brings them all to its price and stops consumption, creates a panic and every man goes in for himself and the devil gets the whole crowd.

SOME PRINCIPLES OF ORNAMENTAL PLANTING.

PROF. S. B. GREEN, Minnesota Agr. College.

The subject which I have to present to you this afternoon is one that does not in the least concern the question of low freight rates or best methods of marketing or growing of crops, but on that account it is none the less a strong subject, and I believe when regarded in its fullness as related to the life of every one here, it will be found to be a matter of great importance.

I am going to talk to you about the value of the aesthetic as applied to landscape decoration. Please don't think of this subject as something only fitted for dilettantes, for it is something that is well worthy of the highest and best that is in you, as it has in all ages past occupied the attention of the brightest minds.

Pliny defined the aesthetic as being the "splendor of the truth". Levoque defined the beautiful as being "a force moving with all order and power". But I like Haven's definition best of all. He defined the beautiful as being "the manifestation of the hidden spiritual nature in a material form".

Viewed at from these standpoints, it partakes of divinity itself.

There are a number of distinct types of ornamental gardening. The common style in the older civilizations was what is known as the *formal*. This was largely artificial, and the gardens and walks were largely laid out on geometrical lines and were graced with statuary and formal balconies and railings. Such a form of gardening is very proper about large buildings, but does not fit well into our ordinary surroundings. A good example of this style of gardening was shown at the Columbian exposition in Chicago and the Louisiana Purchase exposition in St. Louis.



Admirable combination of trees, shrubs and vines for a difficult subject.
The above and following illustrations from photographs furnished by Prof. S. B. Greene, St. Anthony Park, Minn.

The form of gardening which is most popular in this country is known as the *natural* or *English* syle. It consists of so managing of plantings as to fit them into natural surroundings and imitate in them the best that nature does when left to herself. This is the kind of gardening that is generally used in the parks of this country, although we have more or less of the mixed style, which is often used to excellent advantage.

This reference to forms of gardening would not be complete did I not refer to what is sometimes called Japanese gardening. In Japan, landscape gardening has reached a very high degree of development and certain well defined principles are laid down as controlling in it. To really appreciate Japanese gardening one must be imaginative. In this gardening the attempt is made often to represent a certain well known scene, and water is always to be found in such work—either actually or representative. Where water cannot be used, very likely a portion of the garden is arranged so as to show what appears to be the bed of a dry stream, and in Japanese gardens the streams should always come in from the east rather than from the west. If it is a pond it may be represented by a covering of sand, from which the weeds are carefully removed, and which perhaps is spanned by an artificial bridge from which a good view of the whole garden may be obtained. Quite elaborate rules are laid down for the formation of bridges. Gardens of this kind are generally decorated with stone lanterns—in which a small light is placed after dark on special occasions.

IN LAYING OUT GROUNDS.

The most important thing in laying out grounds is to have a plan that shall be sufficiently comprehensive to include the whole scheme of the location of buildings and drives and the plantings of trees and shrubs. Considerable care should be taken with this plan. It should be understood too, that an inferior plan is far better than no plan at all, and that it is very easy and inexpensive to make changes on paper but often very expensive to make them with the actual material.

The grounds about our homes are more or less an index to our character and to our knowledge of the best use of the materials that we can command. We may look upon these grounds as a sort of a setting for the home picture. It is desirable to get the whole family interested in such work for there is nothing that holds the children to the home and excites their interest in country life as the trees and plants that they have helped to set out and care for.

The first thing to be considered in selecting a location for a home is healthfulness and the next is convenience, after which we may well take up the subject of appearance. In planning our grounds, we should consider their relation not only to our holdings, but to everything that can be seen from our location. Especial effort should be made to get good views from the windows of the rooms used the most. We should aim to cut off the view of such things as are unpleasant and to bring in vistas containing such things as go to improve life and around which cluster pleasant associations.

It is a mistake to lay out the plantings around a country dwelling in such shape that they cut off a view of such features as go to make rural life attractive and pleasant, and it is also a mistake to make them too small.

The value of improvements of this character are seldom appreciated, but if the matter is carefully considered, it will be found that there is nothing that we can do to our farm lands that will give us larger returns for the investment than the time and money we put into properly arranged windbreaks about our buildings. Looked at from the utilitarian standpoint, we get wonderfully good returns from suitable windbreaks about our buildings, paddocks, barn yards and gardens and they should be large enough to include all these. In figuring this up, let us suppose that there are on the farmstead fifteen cows. I think that it is hardly too much to say that the advantage it is to them in having a well protected yard in which they can take an airing in winter without too much exposure is worth at least \$1.50 an animal per winter. Then, too, there is a saving in fuel used in the house and greater comfort generally without as well as within the buildings, not only for the farm animals but for the owner and his family in carrying on the ordinary duties of life. Beyond this comes the value of the aesthetic, which is something that cannot be computed and may be priceless. Another important feature of value is the greater pride which the owner takes in a place that is properly developed. This is one of the pleasantest features of rural life.

In considering the laying out of the grounds about a city lot, I use a plan in which the front door of the house is put upon the north or west side, which is the proper place for it unless it is to go in the middle of the house, since the south and east sides are most desirable for living rooms. The path to the front door should generally be straight. If at all curved, it should curve in the direction from which the most travel comes. Do not put in a curve without making some plantings on the bend around which the path is supposed to turn. Do not



Example of Japanese gardening.



Formal style of gardening.

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set the shrubs out all over the lawn, but rather keep them in groups arranged along the sides of the lawn or near the dwelling, or in places where screens are needed. The back of the lot should generally be kept open for a garden, clothes yard, etc. Put as little land as may be into walks and drives as these have a tendency to break up the lawn and make it appear small. They are also expensive to put in and to maintain. Keep the center of the lawn open and unbroken by plantings.

A few years ago, it was the fashion to make the driving portion of streets in resident districts much wider than is necessary. As a rule, a driveway two rods wide is abundant for any street in a resident district that is not used as one of the main arteries of traffic. It is better to have a large portion of the street in grass in the form of well kept boulevards than to have it in gravelly roadways which are not used and are expensive to maintain. Ofttimes, the gutters of roads are best maintained in grass.

The architecture of a house should be in keeping with its surroundings. A large and pretentious house in a quiet and secluded place is not in good taste. The estimates of the cost of a building will generally be exceeded from 25 to 50 per cent. This is especially true with those who are inexperienced in such work and as a consequence when they finally come to grading and planting the grounds about the house, they are apt to be parsimonious and not spend the money they should for this purpose. No future expenditure can atone for shortsighted saving in lawn making at this time. If the material available on the ground for a good lawn is not satisfactory, it would be better to incur considerable expense at this time to make it right rather than have the lawn made of poor materials on which grass will fail to grow successfully.

The slopes to the house should be easy and gradual. Terraces should be avoided as much as possible as they are hard to maintain and generally add little or nothing to the beauty of a place and occasionally are very unsightly. Ofttimes a very nice dwelling does not show off to advantage because the grading is poorly done. For instance, where the top of the terrace is about the height of the eye and the lawn to the house nearly level, the apparent distance from the house to the street is greatly reduced. Steps should be avoided as much as possible as they are expensive and require much care in winter to keep them clean and they are also dangerous.

PLANTING FOR SPECIAL EFFECTS.

Planting of perennial plants may be made so as to give special effects. For instance, we may plant with the object of getting a strong effect in the spring, in summer, in autumn or in winter, or in a large bed it is quite possible to so combine plantings as to secure something of interest in it at all times of the year. It is very easy to secure strong spring effects, since most of our plants flower in the spring and early summer. It is much more difficult, however, to secure good effects from summer planting while for autumn effects, we have comparatively little to work with. Good winter effects are obtained by using plants that have evergreen foliage and striking colors in bark and fruit. A bed with something of interest in it for the whole year may be made as follows:

In front we put such herbaceous plants as irises of various kinds which flower in early spring and are followed by *Baby's Breath*; back of these may come peonies of such kinds as give a succession of bloom for perhaps three weeks. Then may come spring and early summer flowering shrubs such as *Spirea Van Houttei* and other *spireas* flowering at the same time; *Golden Elder* will liven up the somber green of its surroundings all summer by its brilliant and almost golden colored foliage and its white flowers which appear in July; *Spirea sorbifolia* produces its white flowers about the middle of July when little else is in bloom; then may come the hardy *Hydrangea* whose great white panicles will be conspicuous through August and early September; *Pyrethrum uliginosum* will have white daisy-like flowers in September; *New England Aster* has purple flowers in October and *Boltonia asteroides* has white flowers during the same season as the *New England Aster* and is fine in contrast with it.

Interspersed with these plants or back of them may be planted such plants as will give a good winter effect. Among such might be included the *White Birch* and *Red Twigg'd Dogwood* which would show considerable contrast with some of the smaller growing evergreens like the *Arborvitæ* and *Colorado Blue Spruce*, or if the bed is larger, some of the larger growing evergreens such as *White pine* and *Norway spruce* may be used to a small extent.

Other plants will naturally suggest themselves to one who is familiar with the lawn shrubs adapted to this section and it is one of the pleasant things about such a bed that the owner can impart much of his own originality to the methods of arrange-



Profitable and suitable lawn mowers, Hyde Park, London.

ment. Of course the aim should be to have all the plants show off to good advantage and yet have them all near enough together so that they will not have the appearance of being separate, but the whole thing will appear as a mass of light and shade.

WINTER PROTECTION OF PERENNIAL PLANTS.

It has been pretty conclusively shown that most of the herbaceous plants that are hardy in New England and New York can be grown here providing they have suitable winter protection. This protection should generally consist of a mulch of leaves, straw or similar litter, perhaps six inches deep which will hold the snow and prevent severe freezing. Where these plants are covered in winter with a heavy coating of snow, there is nothing else needed, but as this is a section of rather deficient snow fall and in many places the snow blows off, leaving the roots exposed, some attention to winter protection will be found very helpful in the caring for some of our most desirable plants.

Beds of tulips, hyacinths and similar plants should be protected in winter with about six inches of mulch as recommended above for herbaceous plants. This should be covered with a few branches or something of the sort that will keep the mulching from being blown away.

In the case of tender shrubs, such for instance as *Spiraea Thunbergii*, the best way of giving winter protection is to lay the plant on the surface of the ground and cover with a few inches of mulch. Some shrubs that are stiffer in habit than this *spirea* and cannot be laid easily on the ground, are best drawn together and tied in place with soft string and then wrapped with a covering of hay or straw.

Some of our most ornamental evergreens, such as *Abies concolor* and some of the tender *Arborvitae*s should be protected a little in winter. They will often go through ordinary winters without injury but in occasional winters, they would be hurt if not protected. For plants like these which are nearly perfectly hardy, a good way to protect them is to shade them with evergreen branches or similar material. They may also be wrapped with hay.

Newly transplanted street trees and especially those that have smooth bark are liable to sunscald. Among these especially subject to this trouble are the Basswood, Mountain Ash and Soft and Hard Maples. These are often injured the first winter

after transplanting and special attention should be taken to protect their trunks by a covering of burlap or any other material that will serve to keep off the direct rays of the sun. When growing thriftily, these plants are seldom injured by sun scald but some of our best Horticulturists prefer to protect them every winter, as little labor is required to do this and it insures their coming out in the spring in good condition.

Shrubby borders should always be mulched in winter unless they are covered with a heavy coating of snow early in the winter. Many plants that are not killed by a severe winter may be so severely injured and weakened by it that they do not do their best afterwards.

TIME OF PLANTING.

For the beginner the best time for transplanting work in this section is early in the spring, although there are quite a large number of plants that do best if moved in autumn, but on account of the poor planting that is liable to be done by those who have not had experience, spring is generally considered the safest time for this work. In the case of street trees, it is well enough for those who have had experience to set out the hardiest kinds, such as White Elm and Green Ash in autumn, especially in autumns when the ground is in a moist condition. Our hardiest shrubs may also be transplanted in autumn to good advantage, but those that are somewhat tender should be left until spring. With herbaceous plants, the experienced horticulturist will get his best results from autumn planting providing the soil is in good condition. This is especially true of Peonies and Irises.

Some of our best nurserymen recommend buying in autumn and "heeling in" over winter and planting in spring. This is a good plan if the "heeling in" work for winter is well done. If poorly done, there may be great loss under such conditions. I am inclined to think that it is about as well to set out the stock where it is to grow, especially if the plants are small and bend to the ground and cover them, tops and all, with earth and afterward with a little mulch. This practically amounts to "heeling in" each plant separately where it is to grow in the spring of the year. Such a covering should be removed as soon as the plants show signs of starting in the spring.



Elms, Hyde Park, London.
"As it should be,—the grass is worn out but the children are having a good time." Prof. S. B. Greene.

REPORT OF FINANCE COMMITTEE.

IRVING SMITH, Chairman.

Your finance committee are pleased to report that we have gone over the books and accounts of the secretary and treasurer and find same to be in good form and correct. We wish, however, to mention a few points where we think some improvement may be made, and we have brought before the executive board the fact that quite a number of the expense bills turned in by members for attending meetings, visiting trial orchards, etc., are not sufficiently itemized. At our recommendation that body promptly passed an order instructing the secretary to demand itemized bills of all parties having claims against the society.

In our work we have examined every bill, gone over every addition and have found nothing to give the slightest ground for suspicion. We do therefore, heartily commend the work of the executive officers of the society.

Respectfully submitted,

IRVING C. SMITH.

J. J. MENN.

M. V. SPERBECK.

Finance Committee.

On motion, the report of the finance committee was accepted as read and ordered placed on file.

On motion of Mr. Toole, the report of the treasurer and the financial report of the secretary were accepted.

ELECTION OF OFFICERS.

The President appointed the following nominating committee to make selections for the executive committee: Messrs. W. H. Hanchett, D. E. Bingham and H. Melcher.

The President appointed as tellers Messrs. Bingham and Johnson.

Nominations for president being declared in order, Mr. Tip-lady nominated Mr. R. J. Coe and Mr. Philips nominated Mr. George J. Kellogg.

It was moved by Mr. Johnson that the first ballot be made an informal ballot. Mr. Riegel moved as a substitute that the first ballot be a formal ballot. A rising vote was taken and the substitute carried, ayes 37; noes 20.

The result of the ballot was as follows: Total number of votes 78; George J. Kellogg, 27; William Toole, 2; Dr. Loope, 1; R. J. Coe, 48.

Mr. Coe having received a majority of the votes cast, was declared duly elected.

The following were nominated for vice president: Irving Smith, W. H. Hanchett, and D. E. Bingham. The ballot resulted as follows:

Total number of votes cast, 63; necessary to a choice, 32; Mr. Hanchett received 29 votes, Mr. Smith 20, Mr. Bingham 23, Mr. Melcher 1.

There being no choice, another ballot was taken, resulting as follows: Total number of votes cast, 73; necessary to a choice, 37; Mr. Hanchett 37, Mr. Bingham 13, Mr. Smith 23. Mr. Hanchett having received a majority of all the votes cast, was declared elected.

The election of treasurer being next in order, Mr. George J. Kellogg placed in nomination Mr. Franklin Johnson. Mr. Johnson declining to serve, Mr. Hanchett moved that the secretary cast the ballot for Mr. L. G. Kellogg, the present incumbent, which motion carried and Mr. Kellogg declared duly elected.

The nominating committee submitted the following report:

MEMBERS OF EXECUTIVE COMMITTEE.

First district—William Longland.

Second district—Prof. E. P. Sandsten.

Third district—William Toole.

Fourth district—F. W. Harland.

Fifth district—H. C. Melcher.

Sixth district—L. A. Carpenter.

Seventh district—A. J. Philips.

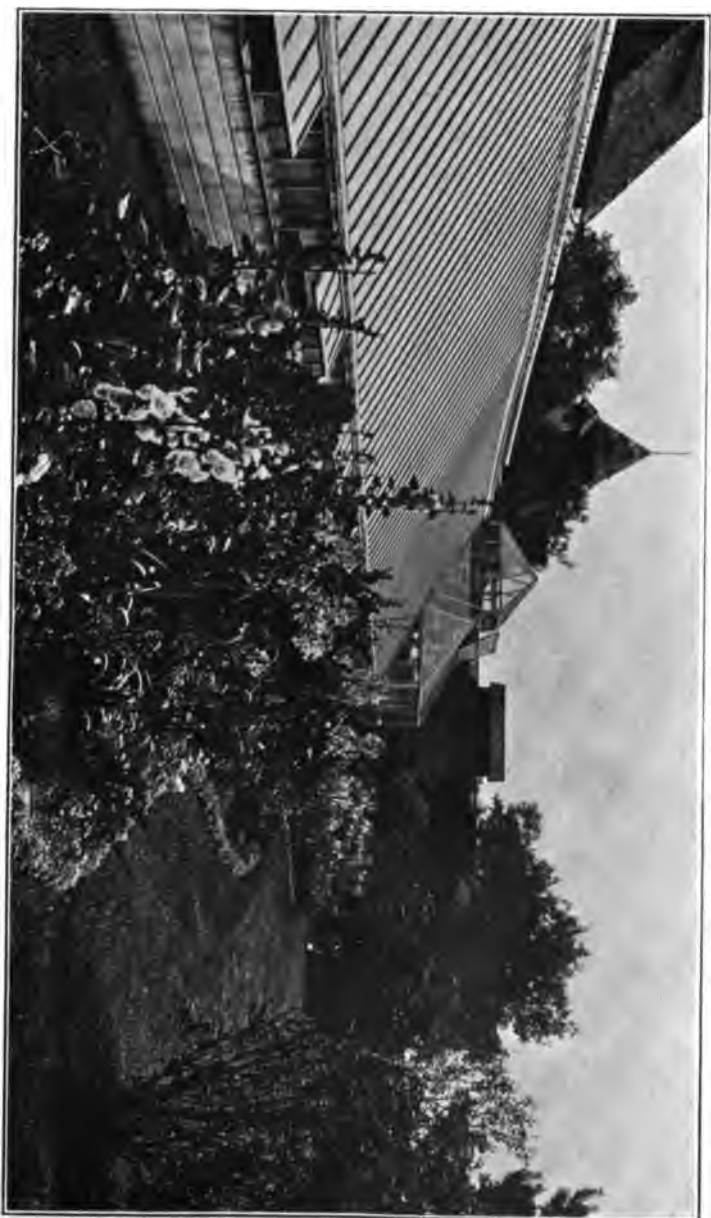
Eighth district—M. E. Henry.

Ninth district—D. E. Bingham.

Tenth district—A. E. Bennett.

Eleventh district—C. L. Richardson.

On motion of Mr. L. G. Kellogg, the report of the committee was confirmed.



Mixed border planting.

REPORTS OF DELEGATES.

REPORT OF DELEGATE TO IOWA.

WILLIAM TOOLE, Baraboo.

The hearty welcome extended to your delegate by the officers and members of the Iowa State Horticultural Society at their annual meeting in Des Moines, December, 1906, was a pleasant expression of the good will of the Iowa horticulturists to the Wisconsin State Horticultural Society.

The first thing to attract attention at the state home where the meeting was held was the grand exhibit of about two thousand plates of apples and other fruits which were mostly of varieties not adapted to Wisconsin. The two most extensive individual exhibits were those by F. O. Harrington of Williamsburg and J. W. Murphy of Glenwood. Of special interest to me was the showing of apples by C. H. True of Edgewood as he had a very fine collection of apples from N. E. Iowa, where climatic conditions are probably nearly the same as in southern Wisconsin. From appearance of the Stayman apple and accounts given it might be worthy of trial in Wisconsin. Nelson Sweet is considered by Mr. Harrington to be the best winter variety of sweet apple and hardy with him. The Northwestern Greening was much used in exhibits to show contrast with the bright red varieties. Much fault is found with this variety because of tendency to rot before ripening and not proving acceptable in quality to most customers.

A very interesting exhibit was a showing of results of spraying done under direction of Prof. J. W. Jones, who has charge of the horticultural extension work of the experiment station at Ames. The work was done in private orchards and the results were strong additional proof of the value of spraying against scab, codlin moth and curculio. Very cordial relations seem to exist between the horticultural division of the College of Agriculture and the State Horticultural Society.

The reports of directors from different sections were of large fruit crops in all parts of the state, although small fruits and cherries had been quite variable. Nothing special was brought out in regard to varieties or cultivation of small fruits. The so-called 'pedigree plants' is considered mainly an advertising expression. In orchard management a blue grass sod retards growth, which may sometimes promote fruiting which has been delayed by a too vigorous growth. Where soil is rich, clover turned under retards fruitfulness, but in other situations is beneficial. Pasturing with shoats is helpful if rooting is prevented. In discussion the general opinion was that very little injury is done to orchards from the rust passing from red cedar. Charles Potter told of some valuable results from crossing the Rockford with other varieties of plums.

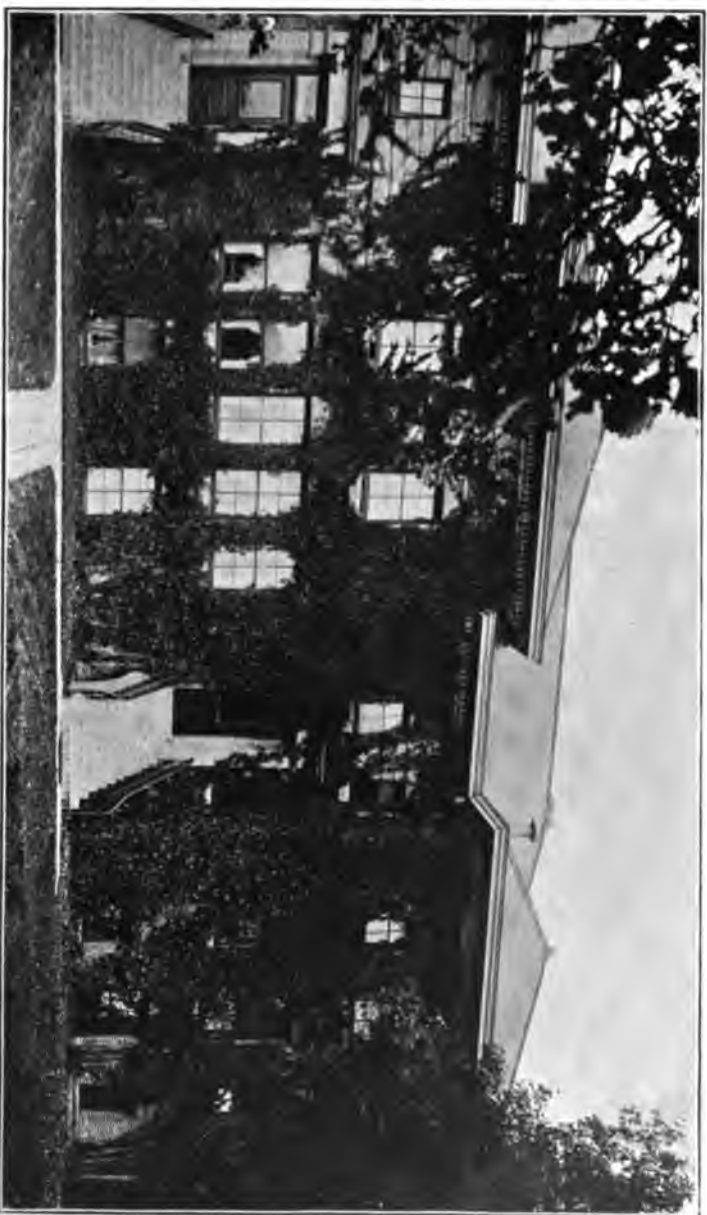
C. L. Watrous made a strong plea in favor of raising new seedling varieties of fruit which was in line with the movement of the society to organize a plant breeders' association. Organization was effected to the extent of electing temporary officers and enrolling names of members.

H. J. Eustace talked of experiments with cold storage of apples. It was then too early in the season to give results, but it is established that fruit for cold storage must not be picked too immature and should be cooled off before being placed in storage. Bruising must be positively guarded against and it will only pay to store first class fruit. Discussion at another time agreed that placing apples in pits is not satisfactory.

Following a discussion of Prof. Beach's talk on spraying a resolution was adopted instructing the legislative committee to secure the passage of a law forbidding the sale of impure Paris Green or other drugs used for insecticides, as much loss has resulted from using Paris Green of such poor quality as was bought from the dealers the past season. The most active members of the society were much interested in having at least one of the society's members hold a place in the State Board of Agriculture. The position was secured for the treasurer, Mr. Elmer Reeves of Waverly.

At one of the sessions Secretary Greene gave the opinion that election of officers should be held at some time independent of any program, as often plans for the good of the society brought out discussions which were not understood by the general public and not of interest to them.

The banquet tendered to the members by Secretary Greene was a very enjoyable occasion. At one of the meetings next day it was moved to appoint a committee to plan for future banquets at the expense of the society and its members instead



Kingemann form of Virginia creeper. Valuable for covering brick and stone.

of permitting Secretary Greene to bear the expense. The thoughts expressed in the toasts given showed an intense state pride and a spirit of promoting state interests. With such a spirit prevailing and with her natural resources Iowa will continue to be among the foremost of the great states of this nation.

Your delegate returned home with the hope of at some future time again meeting the kindly, genial, hospitable horticulturists of Iowa.

REPORT OF DELEGATE TO NORTHEAST IOWA.

H. C. MELCHER.

The territory comprising the Northeast Iowa Horticultural Society includes about one-fourth of the state. This is subdivided into four districts and a director appointed for each district. It is the duty of each director to report the condition of his district to the annual meeting in regard to past conditions and future prospects. At the present meeting the number of directors was increased to six and the districts will be arranged accordingly.

At a gathering of horticulturists in Charles City twenty-one years ago the remark was made that there were only four apples that could be depended upon in Northeast Iowa, these being Duchesse, Tetofsky, Wealthy and Whitney No. 20, the latter being a crab. As a result of the discussions that followed, the Northeast Iowa Society was formed to see what could be done along the line of growing hardy apples. As a proof that they had succeeded, they pointed with pride to the magnificent display of fruit at the present meeting. This was a revelation to most of those attending the meeting. Here could be seen about thirty varieties, mostly winter apples and including many of our own Wisconsin natives, such as N. W. Greening, McMahan, Wolf River and Pewaukee, and grown to such perfection that they would have to be considered in any apple show.

The first session was practically a meeting of "The Old Guard"—most of those present having been members since the society was organized. The reports of the directors showed that it had been a very ordinary year. Large crops of strawberries were raised, but as Iowa had a wet year, the quality was not of the best. Raspberries a good crop with fair prices. Currants are being neglected and practically no replanting be-

ing done, while blackberries were not even mentioned. Plums and cherries a good crop but prices not very satisfactory. All agreed that the grape crop was the largest and best ever raised in northern Iowa.

The apple situation is much the same as in Wisconsin, the summer and fall varieties bearing heavily, while the winter varieties had a very light crop and were reported as not keeping as well as usual. One director reported N. W. Greening badly affected by what he called sun-scald and were at that time half rotten.

Immediately after the report of the directors, President C. G. Patten gave his annual address which was a review of the work of the Society since its organization, and was full of hope for the future.

The paper, "What I would advise a beginner to plant in the apple orchard," brought out the fact that they are growing about the same varieties that we are. Judicious pruning and thinning of fruit was about the only way to secure successive crops of apples. This subject was handled by H. G. Patten of Charles City, and brought out the only pruning talk of the meeting by Wesley Greene who advocated late March or early April as the proper time for that work in northern Iowa. "Planting an Apple Orchard," by G. A. Ivins, was most interesting, and planting thickly with the thought of future thinning was strongly condemned. The thought seemed to prevail that planting thickly induced barrenness and that the habit once formed could not be overcome by thinning.

"Strawberry Experiences" by G. D. Black shows that Iowa growers are up to date in that department, but are at a disadvantage geographically when it comes to marketing the crop. Iowa has but few large cities where they can handle car lots, and the complaint is that the transportation on small consignments is so high as to be practically prohibitory. The varieties grown are much the same as grown here, although many growers still find the old Crescent profitable.

The president's address where it referred to plum culture and the paper, "Plums—The Present Status," by Elmer Reeves would indicate that they are at the beginning of a new era in this department and that they will have something to show us in the near future. Of the older varieties none was spoken so well of as De Soto.

"Spraying and the care of the orchard" by Prof. S. A. Beach was one of the best numbers on the program. The talk was illustrated by charts showing the benefits of thorough work along



Effect of shrubbery around a R. R. Station.

this line. The greatest trouble seems to be to get the smaller growers to take it up, and the only solution would be to have some one in each community do the work for a price.

This session was cut short to allow all who wished to visit the nurseries and packing cellars located here. Through the courtesy of President Patten, conveyances were provided and a guide furnished with each load. As the ground was covered with snow at this time, not much time was spent at the nurseries, but the packing cellars were busy places preparing stock for next spring's delivery. The new packing cellar of the Sherman Nursery Company is one of the largest in the northwest, having a capacity of 1,000 car loads.

One of the pleasant features of the meeting was the part taken by the people of Charles City. The address of welcome by Prof. Hirsch and "The Child's Study of Plant-life" by Prof. Kent being exceptionally fine.

"Door-yard Possibilities" by Ethel Waller was a strong plea to break up the monotony of the average door-yard by a judicious planting of shrubs and flowers that cannot help but benefit all who listened to it.

The program was liberally interspersed with music, both vocal and instrumental and the whole concluded with an illustrated lecture by Prof. MacBride on "The City Beautiful."

All of the old officers were re-elected with the exception of vice president, and the next meeting located at Independence.

REPORT OF DELEGATE TO MINNESOTA.

W. J. MOYLE.

December 4th, 1906, found me safely planted at Hotel Brunswick, Minneapolis, Minn., representing our society as its delegate to the Minnesota State meeting. The morning of the first day found me at the place of meeting, the First Unitarian church. I soon became aware that Wisconsin was well represented, our well known old war-horses, Phillips and Kellogg, being present. The former took me in hand and I was soon well acquainted with all the prominent members of that society.

The first session we were favored with the usual grind of horticultural topics. C. S. Harrison of York, Neb., however, stood out among them as being remarkably magnetic and perfectly at home with his subject, as well as very enthusiastic for a man of his years.

Another very unique feature of the Minnesota meeting was the introduction to the horticulturists of two prominent livestock men who undertook to show the apple-men that they knew berries and beans as well as pork and beef, viz., Prof. Thomas Shaw and Prof. Andrew Boss of St. Anthony Park.

Prof. Shaw came out flat-footed for orchard cultivation in grass for Minnesota. This jarred some of the members but as he backed up his statement with facts it could not be disputed.

Another man, Wm. S. Chowen of Minnetonka, stated that in fifty years he had planted five orchards and up to date had nothing to show for them.

The second session brought forth many interesting topics followed by instructive discussion.

The second day was largely devoted to business sessions, Prof. Samuel Green being elected president in place of Clarence M. Wedge, and to the Woman's Auxiliary, at which some very interesting subjects were presented.

Thursday found the program filled with spraying, seedling-fruits and forestry topics, many prominent people discussing these subjects.

The banquet Thursday evening was of a very high order and unquestionably the best thing on the program was the paper read by Mrs. F. F. Farrar: "An Amateur Horticulturist Under the X-Ray—His Wife Turns It On."

Friday was largely devoted to the discussion of small fruit and garden topics, interspersed with an excellent talk on "cold-storage" construction and results obtained in plant-breeding for hardiness, etc.

Taking it all in all it was a very instructive meeting. The seedling apple men were in evidence everywhere lauding up their particular apple, and I guess they are like the poor spoken of in the "Good Book," we will have them ever with us.

As to putting up a fruit exhibit they are not in it with Wisconsin, as they cannot show the variety, color or quality.

REPORT OF DELEGATE TO WINTER MEETINGS OF
ILLINOIS SOCIETY, DEC., 1906.

W. H. HANCHETT.

When I started to Champaign as a representative of the Wisconsin State Horticultural Society at the winter meeting of the Illinois State Society, the question arose in my mind as to what of value I was expected to impart to the society visited, and what of value I was to bring as a result of this visit to the society sending me in return for the expense incurred.

It was evident that I had a duty to perform or the expense incurred became a graft and I a grafter. The paper in my pocket, which I was to present as a part of the program, was, I felt, a rather poor return for the expense incurred by the Illinois society in entertaining me as its guest, and I feared the knowledge I would be able to absorb and bring back to my own society would be a very meager return for the expenses incurred in the trip.

I arrived at Champaign shortly after noon on Dec. 11th and at once repaired to the Hotel Beardsly, registered, and began to search out the arriving horticulturists, and make their acquaintances as rapidly as possible.

The first session was held at Morrow hall in the agricultural building at Urbana, at 10:30 a. m. of the 12th, and was opened by prayer, following which was the treasurer's report, the several items of which were of absorbing interest to me, in as much as Secretary Cranefield had informed me that our society needed an appropriation of \$8,000 to properly carry on the work of the society, and I had been pondering the subject of whether state appropriations to horticultural societies were wisely expended and were doing a valuable work for the state.

The Illinois appropriation was \$5,000. The heaviest items of expense were the annual report, costing about \$1,600, and the secretary's salary of \$400, the minor items being program expenses, premiums, executive board expenses, etc.

The report showed that the appropriation had all been made proper use of and later in the meeting it became only too evident that many important matters could not be pushed for lack of necessary funds, and I became thoroughly convinced that a much larger state appropriation would have been wisely expended in behalf of the horticultural interests of the state by the society.

The secretary's report gave a summary of the financial affairs of the society, and dealt with the matter of the distribution of the report and other matters, and was followed by a spirited discussion of methods of distributing the report by the members.

The president in his annual address reviewed the valuable work that the society had done in the development of the horticultural interests of the state, the horticultural crops of the past season; cited the value of the station reports and exhibits as an object lesson and discussed the nursery inspection and urged co-operation in making the law effective against the San Jose scale.

The society next took up a discussion of the effectiveness of different arsenites for spraying, and the consensus of opinion seemed to favor Paris Green. In this connection Mr. Stanton stated that lack of any law regarding the matter made Illinois the dumping ground for all the poor grades of Paris Green on the market and urged that steps be taken to provide some means of inspection that would protect the public in this.

The principal features of the afternoon session were a paper on peach growing by Wm. Miller of Ohio, a paper on "Spraying and other items Gleaned from the Apple Crop of 1906," by H. M. Dunlap, and a paper on small fruit shipping and marketing by the delegate from Wisconsin.

The Thursday morning session was opened by prayer, followed by a discussion of the needs of a permanent Experimental Station. Other items of this session were the report of committee on awards, an interesting and instructive paper on Small Fruits on the Farm by W. R. Soverhill and a paper by Dr. Burrill on Weed Invasion which was illustrated by specimen weeds which had gained a foothold in the state.

The afternoon session contained a disappointment in that W. A. Taylor of the Department of Agriculture had found it impossible to be present. State entomologist, S. A. Forbes, gave a very interesting report of the results of the state nursery and orchard inspection which impressed me very forcibly with the seriousness of the San Jose scale and its danger to fruit interests. Professor Forbes reported that the scale had been found in 55 of the 98 counties of the state. That of the infested orchards two counties contained 40 per cent. of the infestation of the state and five counties contained 80 per cent. That 19,000 acres of orchard had been found infested and something like 40 miles of hedge. The inspection had cost the state nearly \$6,000. In the discussion that followed this report, Mr. Smythe, the delegate from Michigan, stated that the en-



A nursery row 50 ft. long of native aster, the offspring in two years of a single stool found clinging to a bundle of nursery stock. A hint to our nurserymen.

terprising fruitgrower of that state had begun to look upon the scale as a blessing in disguise as the thorough cultivator found it comparatively easy to combat and that it forced the shiftless grower who was always depressing the market with poor fruit out of the business. While this may be a good way to look upon this pest when present let us pray that this is a blessing that we will escape.

The session closed with a very instructive paper by Prof. John W. Lloyd on "Promoting the Early Development of Vegetable Crops".

The evening session was a short one consisting of a very pleasing paper by Miss Bernice L. Foster, entitled "Culture and Horticulture," and a thoroughly practical paper by Miss Hettie M. Anthony entitled "Domestic Science, its Growth and Influence". Immediately following this short programme the members repaired to the residence of Dean Davenport where they were royally received and entertained the remainder of the evening.

The session of Friday forenoon was taken up with a discussion of the growers' proportion of the selling price of the apple crop, reports of various committees, and a condensed report of the Experimental Stations by J. R. Reasoner.

This being the last session of the meeting the members scattered to their respective homes.

REPORT OF DELEGATE TO NORTHERN ILLINOIS HORT. SOCIETY.

JOS. D. TRELEVEN, Omro.

The Fortieth Annual Convention of the Northern Illinois Horticultural Society was held in the city of Joliet, December 4 and 5, 1906. Although Joliet is a city that Chicago is much interested in I found everything quiet and orderly and the city tried in every way to make it pleasant for the convention and as your delegate I was made most welcome and treated with every courtesy by the jolly Illinois horticulturists.

The meeting was held in the Assembly Hall of their beautiful Library Building which is thoroughly modern in every detail and built entirely by the city.

Joliet claims more miles of paved streets than any city of the west and high school buildings equal to any in the world.

The city boasts of a Civic Improvement Society with a large membership who are doing a good work. The Northern Illinois Society always change their place of meeting each year and I think by doing so that it is not only beneficial to the organization but to the general public as well. Mr. Thompson, the president, seems to be the right man for a leader and his good work is appreciated for he was again re-elected.

The display of fruit and vegetables was very fine. One thing which was very noticeable was the great number of red apples seen in the display. All apples were smooth and perfect, which tends to show the great benefit derived from thorough spraying as we all know the Illinois horticulturists are right to the front in this important work.

After looking over the fruit and sampling some, we wended our way to the hall. The morning session called at 10:30 a. m. and the address of welcome, response, reports and general business filled the time until the noon hour. In the afternoon three very interesting papers were presented on "Grape Culture and Trimming" and "Growing Strawberries for the Home" and "Curculio and Codling Moth". These papers were listened to with close attention and very spirited discussions followed on each subject.

The first evening's session was given over to the ladies and the programme was full of enthusiasm with papers and practical talks. There was a large audience and these farmers' and horticulturists' wives were listened to with as much interest and attention as was accorded others. I noticed that throughout the session the ladies took an active part in the discussions and that there was a good attendance at all the sessions.

The last day we were treated to a talk by Mr. Beatty of Three Rivers, Michigan, on the subject of "Growing and Marketing Fancy Strawberries". Also interesting papers on "Truck Gardening," "Renewing Old Orchards," "Currants and Gooseberries". The subject of spraying was presented by Senator Dunlap. He deems it a necessity even though we grow only a small quantity of fruit. He claimed he would have eight barrels of No. 1 apples where trees are sprayed to two barrels of No. 2 apples where trees are not sprayed. A report from one of their experiment stations showed that they had made a test on 86 varieties of plums and discarded all but four. The last evening's programme was given by the young people and was held in the lecture room of one of the high schools. The music for the evening was furnished by the students of the high school and was exceptionally fine and added much to the evening's enjoyment and was a rare treat



Tree in middle foreground nursery grown hard maple; one at right seedling taken from woods nearby; planted same day and practically equal in height and diameter, the one on right (woods) being a trifle larger. Photo from H. F. Marsh, Antigo, Wis.



Wealthy planted 3 years. Sunny Side Fruit Farm, Antigo, Wis. W. H. Marsh, proprietor.

and a real pleasure to all. Addresses were given by the State Supt. of Schools of Illinois and by Dean Davenport of Chicago University which were very instructive.

I thank the Wisconsin Society for sending me as a delegate for I had a very pleasant, enjoyable and I trust instructive time.

REPORT OF DELEGATE TO MICHIGAN HORTICULTURAL SOCIETY.

D. E. BINGHAM.

As delegate from this society to Michigan, I have a short report to make. This report is not short because of a lack of good things to report on, but simply for lack of time. Our program is full and therefore I will only attempt to give you a few of the many good points I got while at this meeting. Michigan's fruit interests are large, many individual growers using more Blue Vitrol than the whole state of Wisconsin for spraying purposes, and there was just such men at this meeting, and of course many growers, like our Wisconsin growers, learning and anxious to learn more. I will not attempt to go over the program and mention the good things in each paper, but will simply say that the whole program was right to the point and carried out to the letter. Our meetings were all held in the Bell Opera house and were called to order promptly at the appointed time. The next door to the opera house was a vacant building which was used during the meeting as a fruit display room and also for showing the different styles and makes of power and hand sprayers. This room was always closed while the meeting was in session and in this way all attended the meetings, giving the meetings a very large attendance.

The fruit display was very good.

The most important topics under discussion this year in Michigan were the October freeze and San Jose scale, both of which hit Michigan pretty hard. The topic of San Jose scale was handled in a way that shows very conclusively that Michigan can hold her own even against this insect pest.

The October freeze did untold damage to young orchards, many pulling their's out, others cutting back where trees were young enough.

It would take more time than I have now at my disposal to

tell you of all the good things that were on the program, and therefore I will end my report by saying that I found a real, live, earnest lot of horticulturists at Benton Harbor. I was royally entertained, enjoyed the meeting every minute and feel that great good cannot help but come from such gatherings and discussions.

After a recess of five minutes, the president introduced to the society the visitors and delegates from other states.

Mr. A. W. Bryant (delegate from Illinois State Society): It is a great pleasure to me to have the privilege of meeting with the Wisconsin horticulturists. My home being in the northern part of the state, we realize that our problems in fruit growing and orcharding are much the same as yours here, varying perhaps only in degree and we all know that there are general problems in the horticultural world that we can all help solve and I hope to absorb much from your meeting. It is hardly to be expected that you will get very much from me, but if I can be of any assistance at any time I shall be glad to be called upon. I hope to go back to Illinois with a great many good things.

Mr. R. K. Lemmon (Iowa): I am like the other gentleman, I did not come here for the purpose of teaching, in fact, I know that I cannot teach, I expect to learn. I know that our society has gotten many good things from Wisconsin. Secretary Wilson is an Iowa man and when at Washington he was speaking of the agriculturist, he said that those men that have taken up fruit growing as a specialty are far above the average in energy and intelligence, and I do not think any man can be in this meeting very long before he realizes that Wilson knew what he was talking about. I am glad to be with you and I hope to learn much in this meeting.

Mr. C. H. True (N. E. Ia.): I may say that I am glad to find myself today realizing what for a number of years I have hoped for, and have looked forward to and that is the pleasant privilege of meeting the Wisconsin horticulturists as I am meeting you here today. I need not tell the people of Wisconsin what we are doing in down in Iowa in the way of fruit growing, etc., because quite a number of your members have been with us at different times, both in our district and in our state societies. I might name half a dozen that are present here today that have been present with us at different times and you



**Block of N. W. Greening, Sunny Side Fruit Farm,
3000 trees, W. H. Marsh, Antigo, Wis.**



**General view, Sunny Side Fruit Farm, 3000 trees,
W. H. Marsh, Antigo, Wis.**

all know the very cordial and kindly feelings that have existed between fruit growers of Wisconsin and Iowa for many years past, and I want to say that while I am here in part for pleasure, I also present myself for service and I shall appropriate the very kind invitation of the president in saying that visitors should feel themselves perfectly at home and I am already enjoying very much this pleasant meeting.

Mr. J. H. Turner (N. Ills.): I fell like Mr. Bryant of our state society, that I am here more to learn than to instruct.

Mr. E. Hutchins (Mich.): Mr. President and members, it always gives me a great deal of pleasure to meet with aggressive, progressive, intelligent, enthusiastic horticulturists. I feel at home among that class of people. I may say I have been particularly interested to meet you people here. Every summer we ship our Duchess apples to Chicago and when we are shipping the last lot, the price usually drops and the market reports state that the market is liberally supplied from Wisconsin, and as I have been along up and down South Water street, I have seen as nice batches of apples as I ever saw in my life that they told me came from Wisconsin, and I have been quite interested in meeting men who grow such nice apples. I do not know, Mr. President, but I am getting myself into a little dilemma in saying this, for we grow some nice apples in Michigan and people sometimes get reports mixed and if I am not careful, when I get back home the report will come there that I have said that I saw some of the nicest apples that I ever saw, and some one will ask me where I have been in my state. I will just simply say that those Duchess apples were as nice as any Duchess I ever saw. I will have a little more to say along this line perhaps later on. I want to say this, I have been very much interested indeed in the reports I have heard from your local societies and the fine work you are doing and I have already learned a great deal. I only hope that I may be able in some way to make some little return for all I am getting and expect to get out of these meetings.

Mr. John Howard (Minn.): I am only an amateur in this business and I have little to say this morning, but I am glad to be with you and I hope you will have a good meeting. I am already interested and hope to get more knowledge.

Mr. Roy Underwood: I come from Minnesota also and know Brother Howard pretty well. I know he is very modest; we are very fortunate up there in having Mr. Howard represent us. He is one of the most practical and successful growers in our state. While others have been growing experimental orchards, Mr. Howard has been building up a commercial or-

chard and if there is anything you want to know about our commercial orchards, Mr. Howard can certainly tell you, if any one can in Minnesota.

Prof. Blair (Canada): I did not come here for the purpose of making any speech, in fact, I had not thought such a thing as being called on formally this morning. I come from that northern country, Canada, from the province of Quebec. I might state briefly that I am interested there in McDonald College that is being erected at Montreal by Sir William McDonald, a man who has seen fit to put some five million dollars into an institution that will develop knowledge of horticultural work, devoted entirely to that purpose. That institution is now in the course of erection and I have had so far charge of the horticultural work and am trying to pick up some ideas, find out something that will help us in our work in connection with horticulture. I might say, when I come amongst you as fruit growers, that I feel at home, because I know you are working along the same lines that we are and there is that brotherly feeling that we know exists among all horticultural societies and horticultural people. The program that you have here will certainly interest me, because there are many things on that program that are along the same lines that we are trying to work on in our country. Many of the varieties that you have here are adapted to our conditions more nearly than the varieties that are grown farther south. For instance, you have the Patten's Greening and the Hibernial and some of those varieties which do exceedingly well with us under more or less adverse conditions. Of course, you know our standard variety around the island of Montreal is the Fameuse apple, that old French apple that we think is the best apple on earth except the McIntosh Red, which we think is ahead of the Fameuse, thinking it the best apple yet introduced in our country. I do not say that the McIntosh apple is the apple for you, but we find it much harder that the Fameuse. I know it is not the intention for me to say very much this morning, so I thank you for your kindness.

Mr. Matthew Crawford (O.): You heard enough of me last winter, you will not need more than a word from me today.

Mr. C. G. Patten (Iowa): It gives me very great pleasure indeed to meet the Wisconsin horticultural people. I used to think that I was pretty well acquainted in Wisconsin when Mr. Peffer was living, Mr. Smith and Mr. Plumb and many others of the older members of this society, I seemed to know them all. Yet when I come among you now, I find that I am a stranger to a very large majority of the people here, not having lived in Wisconsin and having lived in Iowa for fortytwo years

and having been so long identified with the horticultural interests in that state and Minnesota, I seem to have a large number of acquaintances and a broadening interest in this matter, so that I really feel, having lived in Wisconsin as long as I did, I feel that when I come back here as though I were in a measure at home. When I come back to Minnesota, I have been there so many times that I feel at home there, and in Iowa, of course, I could not help but feel at home after the long time I have lived there, but it has given me a great deal of pleasure to see such a growth in horticultural interests in Wisconsin and also in Minnesota as we see it there. I am especially glad to see this in Wisconsin, because there have been times I have been here when there have been but a handful of people that would meet here and horticulture seemed to lag for a good many years here, but I realize now, looking over this audience, that we in Iowa, being a little more favorably located in some respects as to fruit growing, as we grow peaches in the southern half of the state, and in quite a section of the southern portion of the state we can grow pears abundantly, I feel that we shall have to be up and doing or else Wisconsin people will leave us far behind.

Prof. Hansen (S. D.): I shall come in for a share of your time a little later in the session, so I wish simply to indicate my horticultural platform. I think 1899 was the last time I was here, perhaps one time before this. The platform is that I believe mainly in our native fruits, but if there is anything anywhere else in the world of any value, we want to get it. In other words, we want the earth in the horticultural sense, anything we can use we want to get hold of and employ in our horticultural operations, and I think with that broad platform to stand on, that we will surely win out. I thank you.

Mr. Graves (Mo.): A Missourian has to be shown; I am on the plate now, but somewhat withered. I am from the almost extreme corner of southwestern Missouri; I was shipped up under refrigeration and since my arrival I have been in cold storage. For a time, however, I have been submitted to quite considerable heat and that deteriorates even good fruit, consequently, I am in a dilapidated condition. I am like one of whom you have read in the old Book, "I am with you in weakness and fear and much trembling," for I contracted a rather pronounced case of grip that stripped me of my appetite, so that I have not been able to enjoy many of the good things I have seen in your state. I anticipate a great deal of pleasure of this trip to the meeting of the horticultural people of Wisconsin. I never have been here before, I had no personal information with regard to your society, and the general condition of

the state, but I have read considerable of these things and I had a very earnest desire to look in upon the Horticultural Society here and see its doings, and I assure you I very much enjoyed the deliberations so far and I am quite sure that this will continue. I believe in reciprocity. We shall be delighted to have you come down into our corner of the world and see us. We grow fruit there, possibly you have heard that that is the land of the big red apple. Missouri has more orchard trees growing in it than any other state in the Union. It does not grow more fruit than any other state in the Union for the reason that many of our orchards are new and have not come into bearing, but later on if things move well, Missouri will be heard from in the propagation of good fruit. I am here, hoping that I may learn much from the horticulturists in this state and I am very much impressed with the enthusiasm with which you take hold of this work.

On motion, the visiting delegates were made honorary members.

Reports of Delegates From Local Societies.

LA CROSSE.

MR. JOHN VAN LOON.

Mr. Van Loon: I have been unable to get a report from our secretary, but Mr. Philips, one of our oldest members, has consented to make such a report.

Mr. Philips: After the Grange played out, we organized an agricultural society, but Mr. Hansen and myself were the only ones that would attend, so we disbanded and then organized the La Crosse County Horticultural Association and we have been keeping that up for twenty-five years, holding four meetings every winter; the ladies bring provisions and we have a free dinner. They discuss agricultural and horticultural subjects and I do not think there is a society in the state that for twenty-five years has done more good than that society. Children that I have seen crawling around on the floor are now old enough to discuss subjects with interest; they are men and women who have been brought up in that environment and every meeting we have there is just as good as a Farmers' Institute. They pack the house at every meeting. For years we have had delegates; last year Mr. Cranefield, I believe, thought there was too much agriculture or other things mixed in and thought they would not pay the expense of a delegate. This year he has consented to pay the expense of Mr. Van Loon. If there is any society in the state that is entitled to a delegate, I think it is that association. The secretary is a young man, Mr. Emil Hauser, and we have a membership of forty.

WAUPACA.

RAY BARNES, Secretary.

MRS. W. H. HOLMES, Delegate.

This report embraces both the Waupaca County and City Horticultural Societies as the county society was merged into the Waupaca Horticultural Society and Improvement Association three years ago. Our society numbers about sixty members. We have held but three meetings the past year. Those were well attended with the exception of the annual meeting in January; the small attendance was owing to a bad ice and sleet storm.

The officers chosen at the annual meeting were as follows:

President—W. H. Holmes, City.

Vice-President—Mrs. L. P. West, City.

Second Vice-President—Mrs. A. D. Barnes, City.

Secretary—P. L. Munger, Waupaca Route 1.

Assistant Secretary—Ray Barnes, City.

Treasurer—L. P. West, City.

A. D. Barnes, chairman programme committee.

Delegate elected to the Wisconsin State Horticultural Society annual winter meeting Feb. 5, 6, 7, 1907, W. H. Holmes; alternate delegate, Mrs. W. H. Holmes.

Our society has taken a deep interest in the work of the state in its practical demonstrations of spraying potatoes, fruit trees, etc., to prevent blight and kindred diseases, as well as other things along those lines which has benefited the fruit men and farmers. The work of Mr. Sandsten on the Chandler farm near Waupaca City in demonstrating the value of spraying potatoes was well written up and advertised by the local press and by the state bulletins and was no doubt productive of great good. Our local nurserymen are busy grafting now. A second nursery on a small scale was started here the past season. Several new seedling apples have materialized but have not been fully tested so as to admit of a report at this time.

OMRO.

MRS. JAS. STEAD, Secretary.

HENRY ROSS, Delegate.

The Omro Horticultural Society respectfully submits the following report for the year 1906:

Our society has held eleven meetings during the past year. At our August meeting we invited Algoma Society to meet with us, we also had the pleasure of having with us at this meeting Professor R. A. Moore of Madison, who gave a very interesting talk on the subject of Corn and Alfalfa.

In November we held a successful Chrysanthemum Show and Fair. We have a membership of 70 with a good attendance at our regular meetings, which we hold at the homes of our members the second Friday in each month.

At the annual meeting held Jan. 11, 1907, the following officers were elected:

President—A. C. Marshall.

Vice-President—Chas. Oak.

Secretary—Mrs. Jas. Stead.

Treasurer—Mrs. A. B. Frees.

Delegate to Winter Meeting—Henry Ross.

Alternate Delegate to Winter Meeting—Mrs. Jas. Stead.

Executive Board—Guy Treleven, W. R. Van Gilder, Mrs. Myrtie Frye, Mrs. Mattie Thomas.

ALGOMA.

H. C. CHRISTENSEN, Secretary.

S. I. SMITH, Delegate.

I take pleasure in submitting the following report in behalf of the Algoma Horticultural Improvement Association.

The Algoma Horticultural Society meets at Algoma Grange hall, three miles west of Oshkosh on the second Tuesday in each month and numbers upwards of fifty members. It is in a flourishing condition socially and financially.

We have a number of practical horticulturists among our members and the discussions at our regular meetings are very

interesting as well as instructive. Other features of the meetings are a literary programme and the serving of refreshments which greatly enhance the sociability of the occasion.

Our public entertainments for the purpose of raising money are always well attended, while our annual dinners which are known as "Old Settlers Dinners," have become an event in which the whole country as well as a large number from the city take part. At the last dinner in March, 1906, fifty dollars was cleared for the benefit of the society.

At the annual election of officers held in January, 1907, the following were chosen:

President—John Athearn.

Vice-President—Thos. A. Cook.

Secretary—H. C. Christensen.

Treasurer—C. Phillipsen.

At the February meeting S. L. Smith was elected delegate to represent the society at the winter meeting at Madison, Wis.

The following were appointed as members of the executive board: Mrs. S. L. Smith, Mrs. John Athearn, Mrs. Geo. Jones, Mrs. Austin Payton.

Mrs. Nelson Sheppard and Mrs. Thos. A. Cook were appointed to fill temporary vacancies on the board.

We respectfully submit the enclosed report.

LAKE MILLS.

DEAN E. SMITH, Secretary.

ROBERT FARGO, Delegate.

Report of the business meeting of the Lake Mills Horticultural Society, held Saturday evening, January 26, 1907, at the home of Robert Fargo.

Mr. George Kellogg acted as chairman and the following officers were elected for the coming year:

President—George Kellogg.

Vice-President—Mr. C. T. Fargo.

Secretary—Dean Smith.

Treasurer—Robert Fargo.

Mr. Robert Fargo was elected to represent the Lake Mills Horticultural Society at the meeting of the State Horticultural Society to be held at Madison on February 5, 6 and 7.

Plans were adopted to hold monthly meetings throughout the year.

Mesdames Bernard and Fargo were elected to arrange programmes for these meetings.

After the business was transacted the following programme was given:

A paper written by Mr. Robert Schultz on "Pears" was read by Miss Grimm of Jefferson.

"My Flower Garden," was read by Mrs. E. J. Fargo.

Mrs. Frank Fargo read an article on "Perennials."

Mr. L. D. Fargo read an article on "Forestry."

The papers of Mrs. E. J. Fargo and Mr. Robert Schultz were published later in the Lake Mills Leader at a request of the society.

The organization consists of twenty-five members. After a discussion of various facts in the interest of Horticulture the meeting adjourned.

SPARTA.

E. A. RICHARDSON, Secretary and Manager.

J. W. LEVERICH, Delegate.

The Sparta Fruit Growers' Association of Sparta, Wis., would respectfully report to you the closing of a very successful year's business, in fact far more successful from a financial basis than any previous year in our existence.

At a meeting of our association held March 17, 1906, our constitution and by-laws were changed and the manner of selling our fruit placed on a co-operative basis. A very marked increase in cash to our members for their fruit has been the result, and all are well satisfied with this system of disposing of fruit. The sale of all fruit has been made by our careful and efficient manager, Mr. E. A. Richardson.

We consider our fruit crop rather light this season, yet our sales reached nearly fifty thousand dollars (\$50,000.00). The expense of grading, selling, and conducting the business was but two and one-half per cent. The report of the treasurer shows a balance of over nine hundred dollars (\$900.00) on the right side of the ledger.

Our association is now in a highly prosperous condition, has nearly two hundred and seventy-five members, with officers as follows:

President—W. H. Hanchett.

Secretary and manager—E. A. Richardson.

Treasurer—D. W. Cheney.

Directors—F. W. Teall, vice-president, J. W. Leverich, B. H. Wright, P. H. Wagner, J. L. Herbst, and W. D. Williams.

Our annual meeting was held Feb. 2nd, at which the association voted to increase the capital stock to six thousand dollars (\$6,000.00), also to purchase real estate in the city of Sparta to the value of three thousand dollars (\$3,000) so as to have our own building and grounds with which to conduct the business of the association.

The following resolution was passed by unanimous vote at the last meeting of our association:

Whereas, a bill has been introduced in the legislature asking that the appropriation to the "Wisconsin State Horticultural Society" be increased to eight thousand dollars (\$8,000.00), therefore be it

Resolved, by the members of the Sparta Fruit Growers' Association in annual convention assembled, that we do hereby request our senator, Hon. H. W. Barker, and our representative, Hon. John R. Jones, to use all honorable means to secure the passage of the above bill in the senate and assembly, as we believe much good can be rendered to the fruit interests of the state by an increase in the amount of the annual appropriation by the state to the State Horticultural Society. Be it further

Resolved, that our secretary be and is hereby directed to forward to our senator and representative a copy of this resolution.

The members of our association wish to extend a cordial and urgent invitation to this society to hold the Summer meeting at the city of Sparta. We will do all in our power to help make the meeting a success, and hope that the executive committee may decide to hold this meeting at Sparta.

More of the workings of our society will be given to this meeting by our manager, Mr. Richardson. I will close this report by extending to all members of the State Horticultural Society an invitation to visit us and inspect our manner of co-operation in the marketing of fruit. Our association has proven, beyond a doubt, that business methods can be as profitable when applied to the management and sale of fruit as to any line of business.

MANITOWOC.

J. A. BOOK, Secretary.

PROF. T. CHRISTENSEN, Delegate.

Report of the Manitowoc County Horticultural Society, Manitowoc, Wis., to the officers and members of the Wisconsin State Horticultural Society.

Manitowoc County Horticultural Society was organized Oct. 20, 1906. The first annual meeting was held at Manitowoc, Wis., Jan. 19, 1907. Owing to inclemency of the weather the attendance at the annual meeting was not as large as expected. Several addresses, very instructive and interesting, were given by several members. Twenty-four different varieties of apples, grown in Manitowoc county, were exhibited.

This society, less than half a year old, has a membership of about fifty, which will be increased to one hundred by the next annual meeting. Meetings will be held in the County Teachers' Training School rooms in the public library building, Manitowoc, Wis.

Resolutions were adopted instructing the Manitowoc county representative in the state legislature to use their influence in increasing the state aid of the State Horticultural Society, and also work to the establishment of a trial orchard in Manitowoc county.

The election of officers at the annual meeting resulted as follows:

President—H. F. Hubbard, Manitowoc, Wis.

Vice-president—J. C. Paulson, R. F. D. No. 4, Manitowoc, Wis.

Secretary—J. A. Book, Manitowoc, Wis.

Treasurer—Fred Christiansen, Manitowoc, Wis.

The above officers constituted the executive committee. The next meeting will be held during the mid-summer.

RUSHFORD.

H. H. G. BRADT, Secretary and Delegate.

In submitting the annual report of the Rushford Horticultural and Improvement Society we are happy to say we retain our interest in our chosen work and are as progressive as ever in fostering the pure and elevating lines of horticulture.

Our society numbers sixty-five members, and we feel that the uniform excellence of our membership contributes greatly to our success, for it is undeniable that successful results must come from intelligent, energetic, and self sacrificing efforts.

All our meetings are held in Eureka; the stated dates of our regular meetings are on the first Saturday in each month. The proceedings are conducted through a regular "Order of Business," in which discussions of selected topics of moment are freely and comprehensively handled.

Programs of entertainment, with music, recitations and readings are provided by committees, and all that are willing to volunteer anything of interest are welcome to do so.

Picnic dinners are furnished by our ladies and are considered a standard institution with us, and all indulge in those bounteous blessings with due appreciation of their merits.

Our flower and fruit exhibits are a delight to numerous visitors and beget a high spirit of enthusiasm with all beholders, many of whom are attracted from a distance by the well known character of our displays.

We have a specialty in propagating hardy seedling apples in which we have developed several valuable varieties.

The deep interest manifested upon the kindred subjects of horticulture and floriculture within the limits of our society are most gratifying, and we feel assured that every member of our association think they are amply recompensed for their efforts in past years in the instituting of and sustaining our general work.

Our officers for 1907 are:

President—Dr. T. E. Loope.

First vice-president—J. F. Diley.

Second vice-president—Mrs. I. E. Becker.

Treasurer—Mrs. M. E. Penniman.

Recording and corresponding secretary—H. H. G. Bradt.

Assistant secretary—Mrs. Mae L. Bradt.

Delegate to 1907 state winter meeting—H. H. G. Bradt.

Alternate—Mrs. Mae L. Bradt.

LAKE GENEVA GARDNERS' AND FOREMEN'S ASSOCIATION.

AXEL JOHNSON, Delegate.

The following is a short report of the Lake Geneva Gardeners' and Foremen's Association's work for the year just gone by:

Meetings have been held once a month regular and several special meetings have had to be held in order to get through with the amount of work on hand. Papers have been written by many of the members on various subjects giving their personal experience on the subject. This has always brought forth a lively discussion and has been very instructive to all.

Several small exhibitions have been held in our hall at our meetings, such as fruit, flowers and vegetables of rare qualities, and scarcely a meeting has passed without something has been brought by somebody for exhibition and discussion. A flower show was held last November and proved a great success in every way. It brought out as fine a lot of exhibition material as you will find anywhere.

In cut flowers: Roses, carnations, chrysanthemums, violets, lily of the valley, etc.

Plants were mostly chrysanthemums, but there were also to be seen an excellent collection of other plants too numerous to mention. Fruits and vegetables were also represented.

We also had a children's chrysanthemum show. Our association distributed over 500 chrysanthemum plants last May with instructions how to grow and care for them until in bloom, among the school children. At the same time and place as we had our show the children had theirs, under the supervision of our chrysanthemum committee, and in the neighborhood of 100 plants were brought. Some plants were very well grown, others were not as good, but if you had seen the children that brought their plants you would have said as we did: "*It was well worth the effort.*"

We had them classified as follows:

Class 1, consisting of 1 and 2 grades.

Class 2, consisting of 3 and 4 grades.

Class 3, consisting of 5 and 6 grades.

Class 4, consisting of 7 and 8 grades.

Class 5, consisting of gardeners' children.

Four prizes were given to each class: 1st prize, \$5; 2nd, \$2.50; 3rd, \$1.50; 4th, \$1; thus distributing \$50 in prizes

among the school children. It would be well worth the trouble for other societies to try it.

We have 50 active members in good standing, 9 associate members and 36 honorary members (mostly employers).

Financially our association is in very good standing:

Our income for the year.....\$839 75

Our expenses for the year..... 494 86

Cash on hand\$344 89

CRANBERRY GROWERS.

A. C. BENNETT, Secretary.

A. E. BENNETT, Delegate.

Dear sir: I herewith submit my report of the Wisconsin State Cranberry Growers' Association for the present year:

President—A. E. Bennett, Grand Rapid, Wis.

Vice-president—O. O. Potter, Grand Rapids, Wis.

Secretary—J. W. Fitch, Cranmoor, Wis.

Treasurer—J. J. Emerick, Cranmoor, Wis.

Member of executive committee, J. B. Arpin, Grand Rapids, Wis.

Life members, 26; ordinary paid-up members, 24.

Cash on hand, \$252.63.

The association holds two meetings annually, one on the second Tuesday in January, the other on the Tuesday succeeding the second Monday in August. The association is in a united, healthy condition and of great service to its members.

PREMIUM LIST OF THE
WISCONSIN STATE HORTICULTURAL SOCIETY.

The following premiums were offered for Exhibits of
Fruit at the Annual Meeting

Madison, February, 5th, 6th, and 7th, 1907.

1. Best Collection of Apples, not less than 25 varieties (3rd premium \$3.00).....	\$10 00	\$5 00
2. Best 4 varieties Winter Apples for market; quality, hardiness, productiveness, keeping qualities and appearance to be considered	3 00	2 00
3. Best 3 varieties Winter Apples for family use; qualification as above.....	2 00	1 00
4. Best New Apple named and in bearing at least 5 years but not on Society fruit list	5 00	2 50
5. Best Seedling Apple.....	3 00	2 00
6. Best Plate Baldwin.....	1 00	50
7. Best Plate Ben Davis	1 00	50
8. Best Plate Dominion	1 00	50
9. Best Plate Dudley	1 00	50
10. Best Plate Fameuse	1 00	50
11. Best Plate Gano	1 00	50
12. Best Plate Gideon	1 00	50
13. Best Plate Golden Russett	1 00	50
14. Best Plate Longfield	1 00	50
15. Best Plate Malinda	1 00	50
16. Best Plate Mann	1 00	50
17. Best Plate McIntosh	1 00	50
18. Best Plate McMahan	1 00	50
19. Best Plate Milwaukee	1 00	50
20. Best Plate Newell	1 00	50
21. Best Plate Northern Spy	1 00	50
22. Best Plate Northwestern Greening.....	1 00	50
23. Best Plate Patten	1 00	50
24. Best Plate Perry Russett	1 00	50
25. Best Plate Pewaukee	1 00	50
26. Best Plate Plumb Cider	1 00	50
27. Best Plate Seek-No-Further	1 00	50
28. Best Plate Scott Winter	1 00	50
29. Best Plate Sutton Beauty	1 00	00

30. Best Plate Tolman	1 00	50
31. Best Plate Twenty Ounce.....	1 00	50
32. Best Plate Utter	1 00	50
33. Best Plate Wagner	1 00	50
34. Best Plate Waldbridge	1 00	50
35. Best Plate Wealthy	1 00	50
36. Best Plate Willow Twig.....	1 00	50
37. Best Plate Windsor	1 00	50
38. Best Plate Wolf River.....	1 00	50
39. Best Peck Northwestern Greening.....	2 00	1 00
40. Best Peck Wealthy.....	2 00	1 00

LIST OF AWARDS—WINTER MEETING.

Your committee appointed to award premiums on the fruit exhibit would make the following report:

We find on the tables upwards of 350 plates of fruit, mainly winter varieties of apples, upon which we have awarded the following premiums:

Best collection of apples, not less than 25 varieties. First, Henry Simon; second, Bingham and Lawrence; third, John Reis.

Best 4 varieties winter apples for market, quality, hardiness, productiveness, keeping qualities and appearance to be considered. First, A. D. Brown; second, Henry Simon.

Best three varieties winter apples for family use; qualifications as above. First, Bingham and Lawrence; second, A. D. Brown.

Best new apple named and in bearing at least five years but not on society fruit list. First, John Reis; second, A. N. Kelly. Seedling. First, John Reis; second, M. V. Sperbeck.

Baldwin. First, Bingham and Lawrence.

Ben Davis. First, A. N. Kelley; second, E. D. Hopson.

Dominion. First, Bingham and Lawrence.

Fameuse. First, John Reis; second, Henry Simon.

Gano. First, John Reis; Bingham and Lawrence, second.

Gideon. First, John Reis.

Golden Russett. First, Henry Simon; second, James P. Oleson.

Longfield. First, A. D. Brown; second, Bingham and Lawrence.

Mann. First, A. N. Kelley; second, Geo. J. Kellogg.

McIntosh. First, M. V. Sperbeck; second, Bingham and Lawrence.

McMahan. First, A. D. Brown; second, A. N. Kelly.

Newell. First, A. D. Brown; second, John Reis.

N. Spy. First, P. J. James; second, A. N. Kelly.

N. W. Greening. First, Bingham and Lawrence; second, James Riley.

Patten. First, John Reis.

Perry Russett. First, Henry Simon.

Pewaukee. First, A. N. Kelly; second, Henry Simon.

Seek-no-Further. First, Geo. J. Kellogg.

Scott Winter. First, A. D. Brown; second, Bingham and Lawrence.

Tolman. First, Henry Simon; second, Janes P. Oleson.

Utter. First, Geo. S. Church; second, Geo. S. Church.

Waldbridge. First, Henry Simon; second, John Reis.

Wealthy. First, A. D. Brown; second, Bingham and Lawrence.

Willow Twig. First, Bingham and Lawrence; second, Henry Simon.

Windsor. First, Bingham and Lawrence; second, Geo. G. Kellogg.

Wolf River. First, Henry Simon; second, A. N. Kelly.

Peck N. W. Greening. First, Bingham and Lawrence; A. N. Kelly, second.

Peck Wealthy. First, A. D. Brown; second, Henry Simon.

Your committee also finds on the tables plates of several varieties not included in the premium list. We find a plate of Merrimac grapes exhibited by Geo. J. Kellogg for which we would recommend a premium of 50 cents and a plate of seedling pears exhibited by Janes P. Oleson and premium of \$1.00

Respectfully submitted,

C. H. TRUE.

C. G. PATTEN.

L. G. KELLOGG.

REPORT OF COMMITTEE ON FINAL RESOLUTIONS.

WM. TOOLE, Chairman.

The following resolutions were presented:

Whereas, a very great amount of damage is done every year to nursery and orchard trees as well as ornamental shrubbery and

Whereas, the amount of injury done by these pests to the nursery men and orchardists is steadily on the increase.

Resolved, that the Wisconsin State Horticultural Society in annual convention assembled do earnestly request that our state legislature shall remove all restrictions from efforts to suppress the rabbit nuisance.

Resolved, that the Secretary of this Society is hereby instructed to cause these resolutions to be placed before the proper committees of our State Senate and Assembly.

Resolved, that the Wisconsin State Horticultural Society recommends that "single plates" of varieties of fruits shall, when placed on exhibition at the State Fair be arranged separately from "collections".

The Secretary of this Society is instructed to convey a copy of this resolution to the Secretary of the State Agricultural Board.

Resolved, that the chair appoint three members to constitute a committee to conduct means and methods of rendering assistance to villages and cities in civic improvement.

Such assistance only to be rendered on application of a total number of members resident in the village or city making the request and further that the total number of petitioners shall be equal to one member for each 500 population.

Resolved, that in appreciation of the devoted and excellent services rendered in the interests of the Society by the retiring officers, the Society extends a vote of thanks and its felicitations to Ex. President Loope and Ex. Vice President Coe; also that this resolution be recorded in the annual report and further that the Secretary be and is hereby instructed to convey directly to each of these retiring officers the sentiment of this text.

RESOLUTIONS OF THE STATE HORTICULTURAL SOCIETY PETITIONING THE LEGISLATURE.

Whereas, it has come to the knowledge of the State Horticultural Society that a bill providing for the purchase and maintenance by the state of Wisconsin of the Devil's Lake region to be used as a State Park; and,

Whereas, this Society believes that such a park will be of great and permanent usefulness and a source of continued enjoyment to the people of the state and of the country at large, both of this generation and of the generations to come; and,

Whereas, since it is clearly apparent that this Devil's Lake region, as well as many other beautiful regions, are fast disappearing and subject to complete devastation; and,

Whereas, this Society is firmly of the belief that regions of unique and unusual beauty such as these are the natural heritages of the people and should as such be under the control of the people;

Be it resolved, that the State Horticultural Society representing its 550 members, this day assembled in annual convention at Madison, Wisconsin, does hereby respectfully and urgently petition the legislature now in session to enact such laws as will in the opinion of its honorable members adequately and suitably provide for the acquisition by the state of the Devil's Lake region; and,

Be it further resolved, that the secretary of this Society be instructed to cause these resolutions and this petition to be presented to those honorable bodies, the Senate and the Assembly, now in session.

Madison, Wisconsin, February 7, 1907.

LIST OF CONTRIBUTORS TO STATE FAIR EXHIBIT, SEEDLINGS.

James Apker, Baraboo.

John F. Swartz, Kenosha.

K. K. Newhouse, Clinton.

E. D. Orr, Mt. Hope.

Janes P. Oleson, Fond du Lac.

A. D. Brown, Baraboo.

Edward Hanko, Sandusky.

E. M. Menn, Norwalk.
D. C. Buckstaff, Oshkosh.
M. H. B. Cunningham, Rockbridge.
Will L. Taylor, Mt. Hope.
L. A. Carpenter, Fond du Lac.
H. F. Marsh, Antigo.
Urso Downey, Whitewater.
Geo. Gaylord, Merrillan.
C. G. Johns, Clintonville.
Fred Rood, Genoa.
Ansel Smith, Sparta, Wis.

THE DUDLEY APPLE.

AN APPLE OF MERIT FOR NORTHERN WISCONSIN.

The Dudley, sometimes called North Star, is an apple that can be safely recommended for culture in the northern counties of this state.

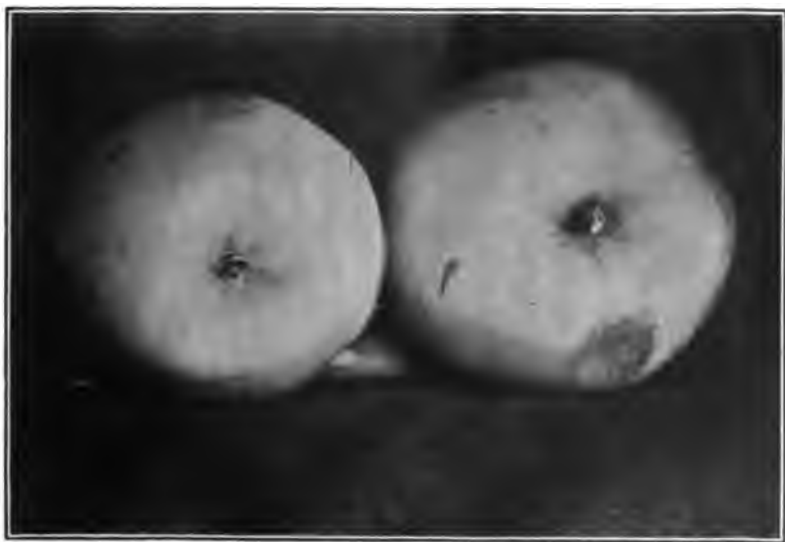
The tree is very hardy, a vigorous grower and productive. The fruit averages larger than Oldenburg and ripens in October at Wausau, Marshfield and points north of these places. Farther south it ripens with Wealthy or a trifle earlier. The following history and description is from Vol. II of the "Apples of New York" by Prof. Beach:

"A seedling of the Oldenburg, which originated with J. E. Dudley, Castle Hill, Aroostook county, Maine. A few years ago it was introduced by a Rochester nursery under the name of North Star, but it was afterward found that this name had already been given to another variety and therefore the name Dudley Winter was retained for it which, according to the accepted rules of nomenclature, is shortened to Dudley.

"A very hardy and productive variety which is being planted to a considerable extent in northern New England. The fruit is pretty large, bright greenish-yellow washed and splashed with red, quite attractive in appearance and good in quality. Munson says that it is perhaps now more widely grown than any other of the newer sorts that have originated in New England. He considers it a valuable acquisition as a winter fruit for northern localities. As fruited at Geneva it is in season in September and October, although it may sometimes be kept into winter. It is recommended for trial particularly where a very hardy apple of its season is desired."



**Wendorff Seedling, much reduced, specimens from Wausau Orchard.
Sept. 8, 1906.**



Wendorff Seedling calyx and stem ends.

Mr. Herman Kauffman of Marshfield writes as follows of the Dudley:

"In regard to the North Star or Dudley apple, will say that the trees with which I am best acquainted were bought of a Rochester, N. Y., firm and planted in the spring of 1897. Mr. Peterson of the town of Lincoln, Wood county, planted twelve trees, of which one died and the remainder have done well, bore first fruit in 1900. These trees were planted in sod but well mulched every fall with stable manure. In 1905 these trees averaged five bushels per tree. Tree a strong grower, somewhat spreading, blights some but not more than the Duchess, quality of fruit better than Duchess, keeps well into October and does not crack and get mealy in storage as the Duchess does. Tree as hardy as Duchess so far."

The four trees of Dudley in the Wausau trial orchard are most excellent trees, showing no sign of blight or canker. These trees bore heavily in 1904 and 1906 and a fair crop in 1905.

Of the four Oldenburg seedlings in the Wausau orchard, viz.: Dudley, Milwaukee, Hoadley and Morgan, the Dudley is easily the best in all respects.

THE WINDORFF APPLE.

This is a Marathon county seedling apple and should prove especially valuable for central and northern Wisconsin. It is an early winter apple, keeping fairly well under ordinary cellar conditions until December or later. The variety originated on the farm of Albert Windorff of Marathon county.

Mr. A. J. Phillips, our veteran pomologist, who top grafted the Windorff tree in the Wausau trial orchard, writes as follows:

"Yours asking about the Windorff apple received. The seeds were planted by Albert Windorff in the Town of Stettin in Marathon county, nine miles from Wausau. The seeds planted were of the Northern Spy. The old tree resembles the McMahon, is not as upright a grower as the tree I top grafted in the Wausau orchard on a Virginia crab, that is a beautiful tree. Mr. Windorff tells me it has stood 44 below zero and bore apples the next season. It does not equal the McMahon in size on an average, but is better in quality and keeps longer. Mr. Windorff has kept it and had it on his table on Easter Sunday."

A description with notes prepared from specimens from the trial orchard tree follows:

Size: Medium to large.

Shape: Oblate to conic; more or less furrowed; generally one-sided.

Color: Yellow, blushed or partly overspread with light carmine; dots numerous and distinct.

Cavity: Abrupt, deep, extending to core; furrowed; calyx open.

Basin. Broad, deep; stem medium, stout; core open.

Flesh: Greenish white, crisp, juicy, a trifle coarse; mildly acid, with flavor resembling Fall Orange.

Quality: Fair to good.

Season: Sept. to Oct.

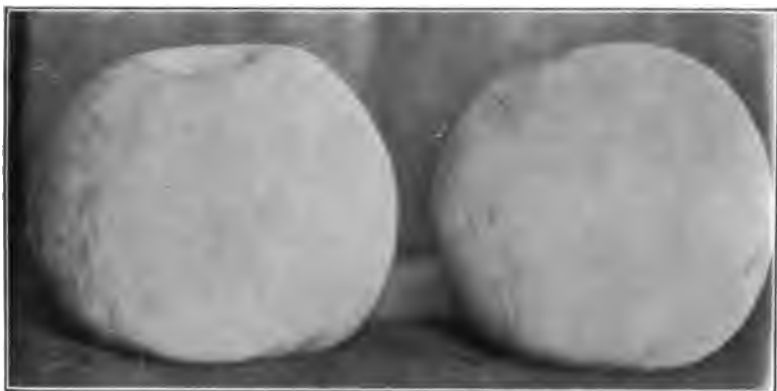
Notes: This apple does not color highly, only exposed specimens showing much red. Prevailing color when ripe, yellow. A large apple, approaching McMahon in size and excelling in flavor and keeping qualities.

Specimens from tree in Wausau orchard.

This tree was topworked on Virginia crab by A. J. Phillips in 1897 or 1898 and is fully hardy at Wausau.

L. D. FARGO, LAKE MILLS, ON TREES.

If we would keep hearts fresh, as the years go by, let us plant a few trees. The tempered light of a lovely grove is a perpetual morning. All the way down, until this later period, there seems to have been hallowed associations, and sometimes superstitious reverence for trees. They make us better. That eye must be blind that does not see the Divinity, in planting the forest. Language fails to portray the beauties of our Burr Oak wild woods; the green carpet decked with ten thousand beautiful flowers; the native stillness so restful during those pioneer years. The home of the Druid Gods. Do you wonder that I love the trees? God is there. Every leaf is a miniature tree of itself. Says one "What a thought that was when God thought of a tree". Yes, a single tree, originating in an atom of seed, deriving its vitality from the heavens, gathering its nourishment in part from the earth, feeding upon the air, selecting its coloring from the sunbeams and elaborating its several parts by the mysterious power of its own vitality. Nothing can rival their grandeur and scenic beauty. Flowers of



The Dudley apple, much reduced, specimens from Wausau orchard, Sept. 8, 1906.



End views of above.



Section of above.

every hue to delight with beauty and regale us with odor. Fruits to supply our wants, timber to supply purposes of art and industry. We may yet learn the value of trees, not only for their sympathetic beauty and food, but for their healthful helps, as weather modifiers, rain helps and wind breaks. It is well to remember that a tree is for something more than a lumberer of the ground. The wildest tribes of men can see the handiwork of the Great Spirit in a tree. Shall we, who claim the highest degree of civilization, the leaders of men, shall our great state suffer all our native forests plundered, and at home what few groves ruined by cows? Shall this generation rob God of all its perfect beauty? The Gods planted for us, is this generation's greed so great as not to leave a few groves to those who come after us? Every community has a large interest in having the road side and hills tree clad and the peat marshes grow something besides brakes and worthless weeds. We all have a claim to natural beauties and sublimities. Individual or corporation rights in a parcel of ground should not cause it to be an ugly spot, or a barren waste. Natural glories cannot be owned by an individual. We get health and pleasure and oftentimes inspiration from these shady bowers and timbered hills. Travelers tell us that there is nothing attractive about the ruins of an old castle, that so many visit, but it is the surroundings, the stately trees, branches locking and interlocking, the wild wood groves, creeping vines over the ruins and memories of the past, that induces so many tourists to visit these relics.

The enchantments of Tyranena are not all its crystal waters or foaming billows, or excellent fish and boating. When I first saw it, old oaks beautified the hills, shimmering poplars, lindens and graceful elms o'rhung the lake borders, a restful shade for summer birds and underneath a sporting place for the finny tribe. Here on these trees the fish hawk built her nest and reared her young. Black birds sang their morning and evening songs. There had been no wood fiend to disturb the native grandeur, no ruthless hand marred the lake border, a restful place. Drouths follow the destruction of forests, as retribution follows sin. The lesson has been learned in the hard school of experience. Our wild woods are mostly gone and the cow has killed the most of our groves, a year or two more will about use up the supply of hard wood fuel for our villages. Coal at nine dollars a ton does not look very cheering. Swamp bogs, commonly called peat, has proved itself a nuisance. Corn is too dear; conducting steam or water pipes, a failure. I see no way out of this dilemma but to plant trees.

I planted out at least a thousand last year. When there is an open space in my timber I stick in trees. This we have followed for years. My timber lots, one of 20 acres, the other of 25 acres, are unequaled in this vicinity. We put out maple, butternut, white ash, basswood, elms, cedars, black walnut, western catalpa, boxwood. Burr oaks are too slow growth; the white willow and tamarack for the marshes. We have tested all of the former. We plant the seed of the maple, butternut and catalpa where they can be cultivated. The others propagate themselves from trees set in the grove, near our farm residence. Basswood is easily cultivated; take a sprout of last year's growth chipped from the root of a tree or stump with scarce any fibrous roots if properly set and mulched will do well. I prefer small trees. In setting one year's growth, I usually press the spade down the length of the blade, press down on the handle to enlarge the space, lift the handle and place the tree back of the spade, be careful in pulling up the spade, press the ground with your foot and put some leaves around as a mulch. A man with a boy to handle the trees can set several hundred a day; then keep the cattle off the field and you will grow timber. The white willow simply needs to be driven down into the peat about 14 or 15 inches, the sprouts near the ground rubbed off, if you wish to grow a tree, stamp the snow in winter close around the tree, to prevent the mice from girdling them when small. Mr. Raynor tells me he has cut his twenty rod hedge twice in eleven years, thinks the last cutting was between ten and eleven cords in bulk. It makes good wood when dry. Then why not grow something besides brakes and worthless weeds on wet land and thus add to our fuel supply. Beautify our residences and the roadside by setting in hard wood trees and thus cause our posterity to call us blessed.

L. D. FARGO.

Lake Mills, Wis., Feb., 1907.

(Mr. Fargo is at this date 83 years young.—Editor.)

FINANCIAL REPORT OF SECRETARY.

(Omitted, by error, from Report of Secretary, pp. 67-74)

Membership fees	\$397 00
Books sold	3 73
Fruit and plants	57 10
Refund	6 00
Refund	5 32
Order No. 534	300 00
Order No. 598	25 00
Order No. 600	75 00
Order No. 648	100 00
Order No. 698	364 24
Eleven salary checks	1,100 00
	<hr/>
	\$2,433 39

Credits.

Feb. 9. Cr. by payment to L. G. Kellogg, Treas.	\$55 00
Mar. 27. Cr. by expense account allowed	112 75
Mar. 31. Cr. by expense accounts allowed	256 05
Oct. 4. Cr. by expense accounts allowed	297 56
Dec. 16. Cr. by expense accounts allowed	64 23
Cr. by eleven salary checks	1,100 00
1907.	
Feb 5 Cr. by expense account allowed	133 53
Feb. 5. Paid to L. G. Kellogg, Treas., to balance	50 03
Feb. 5. Paid to L. G. Kellogg, Treas., member- ships etc.	364 24
	<hr/>
	\$2,433 39

A FLOWER CONVENTION.

FROM THE WISCONSIN AGRICULTURIST, Sept. 13, 1906.

The recent convention of the State Horticultural Society at Baraboo was not less enjoyable than others in past years. This alone is saying much. If we say it excelled in many respects any heretofore held it will be but feeble praise. The weather was perfect. Few of those attending from outside points waited for the later trains, but came in a day ahead in order to enjoy for a time the many beauties of Baraboo and the Devil's Lake region.

Horticulture has a closer hold on the hearts of its devotees than any other pursuit. Nothing could show this plainer than the attendance this busy year of abundant harvests in a busy season, of men and women who are not as a rule rich enough to afford much leisure. They were from all parts of the state and reversed the common practice of conventions marked by boisterous nights and late mornings. They were bound to "do the town," but by daylight trips, climbing "Cheek hill" for a view of the city and the lake bluffs, usually before breakfast. The programme was one of unusual excellence. All of the papers showed care and thought in their preparation, and the results of this convention should and will serve to bring to the attention of thoughtful landscape gardeners and nurserymen throughout the United States the wealth of material available for the decorative purposes native to this state.

"Native Ferns," by William Toole, and "Some Native Flowers Worthy of Cultivation," with the discussions following, occupied the forenoon session. In the afternoon John Tiplady presented a splendid paper on "Native Shrubs," as did William Longland on "Native Aquatics". These gentlemen are professional gardeners from Lake Geneva and thoroughly trained in all branches of their profession. One of the most delightful papers was by Mrs. J. E. English of Baraboo on "Native Fungi," illustrated by a splendid collection of fungi, including, in addition to the commoner edible and poisonous mushrooms, many rare and interesting specimens. These papers, as well as others, will appear in full in early issues of the Agriculturist.

Some disappointment was expressed at the evening session when it was announced that Park Superintendent Mische of Madison would not be present. His paper was read by the secretary.

Although not announced on the programme, a feature of marked interest was an address by Mr. W. M. McFetridge of Baraboo on the proposed Devil's Lake park proposition.

Mr. McFetridge is working with a commission which has been appointed by the governor of the state. This committee is to report to the legislature next winter on the necessity and feasibility of reserving an area about Devil's Lake including not only the lake and short line, but several square miles of the surrounding bluffs and forest area with a view of preserving for all time the beauties of this remarkable region. That such a step is necessary was shown by Mr. McFetridge. The forested area comprising the watershed supplying the lake is being rapidly cleared of timber, resulting in a marked lowering of the lake. The deforesting also results in the destruction of the remarkable flora of this region.

Another source of this immediate danger is the marring of the bluffs on the lake shore by the removal of immense quantities of rock by Chicago firms. This is being removed by trainloads, resulting already in ugly scars on the face of the bluffs, and if allowed to continue will ultimately destroy their scenic beauty. That Mr. McFetridge's plea fell on no unwilling ears was proved by the society endorsing the proposed plan of a state park by the following resolutions:

"Whereas, There is a movement now on foot to induce the state of Wisconsin to establish and maintain a state park at Devil's Lake; and,

"Whereas, The project to preserve for all time this beautiful region, now threatened by destruction, appears a commendable one which should receive the support of every citizen of our state; and,

"Whereas, From a horticultural standpoint, the preservation of the region is particularly desirable, since it includes and primarily is for the protection of the flora and for its increase and development; be it

"Resolved, That the State Horticultural Society unanimously declare itself in favor of the said project and endorses it; and, be it further

"Resolved, That this society recommends that the next session of the legislature appropriate a sum sufficient to purchase and set aside this region to be used and maintained as a state

park, subject to the state laws, and open to the use and enjoyment of the people of the state, for this generation and for the generations to come”.

THE FLOWER SHOW.

Four distinct features marked the flower show at the convention. First, the generous display of native and garden flowers from the vicinity of Baraboo. This alone was sufficient had space been available to allow the exhibits proper staging to make a complete show. Mrs. Wm. Helm exhibited fifty vases of garden flowers, others nearly as many. The display of asters was especially fine.

Second, the display of potted plants by amateurs, in other words, “house plants” in the strictest meaning of the term. The Baraboo ladies entered into the liveliest competition in this class, Mrs. Mary Arnott capturing most of the prizes.

The third and most instructive feature to the majority of those present was the splendid collection of gladioli sent by John Lewis Childs of Floral Park, New York, and Vaughn’s greenhouses of Chicago. The former exhibit comprised fifty-one vases of gladiolas in seventeen choice varieties, including one hundred spikes of the new America, a beautiful shell pink gladiolus. The display of gladiolus by Vaughn, while less in extent, was marked by superior excellence of bloom. The spikes were immense in length and size of flowers.

In addition Vaughn sent a collection of ferns, palms and other decorative plants. This collection was afterwards purchased by Prof. Sandsten for the university greenhouses.

The fourth and most attractive feature of the show from the standpoint of the average visitor was the two monster water lily leaves sent from the Missouri Botanical Garden at St. Louis.* These giants measured each a trifle over six feet in diameter! In a letter from Supt. Irish accompanying the leaves he says: “Just before the leaves were cut I had the pleasure of standing upon one of them as it floated in the water, thus showing how much weight it might bear”.

* See letter p. 24.

The committee on resolutions not being ready to report, the following resolutions were read by the secretary:

Resolution in regard to suppressing rabbit nuisance was adopted as read.

Motion to appoint committee to investigate methods of assisting villages in civic improvements, etc., was carried.

Resolution regarding Devil's Lake region was adopted.

Resolution regarding two-cent passenger rate was lost.

Vote of thanks to retiring officers was carried unanimously by a rising vote.

Resolution referring to single plates for exhibition at State Fair was adopted.

Resolution regarding national law for regulating fruit packages was read and adoption moved.

Mr. Reigel moved to lay on the table.

Mr. Hutchins: May I offer a suggestion here? There is quite a general movement in this regard. I am sorry you have not had time to take this matter up and discuss it more generally. The matter was brought before the Michigan society and it was heartily adopted. The proposition as it now stands would be, as I understand it, that each of these main horticultural associations, as well as commission men, shall appoint a member who will meet at some point in the not distant future and agree on some measure of legislation which shall meet the exigencies of the case. The proposition as it now stands should be something along the line of what is known as the Canadian fruit market law. Briefly stated, it requires that all packages that are under standard size shall be marked "short" packages, whether barrels or boxes or anything else. Of course the act would necessarily prescribe what constitutes a standard package and anything short of that should be marked "short" package, and prescribe something with reference to the fruit that should go into barrels or packages and that only a given per cent. of the fruit shall be below that standard, so that there can be something in the nature of uniform packing, that is, honest packing. Then it would be necessary to have a system of inspection. In Canada they have a very efficient inspection law. Very few inspectors are sufficient to hold these packers in shape. The name of the packer is placed onto the package and his address, and the very fact that that package is liable to be found somewhere by some inspector and come back upon the packer is sufficient to restrain very largely a great deal of the crooked packing that is spoken of so largely now. Briefly stated, that is what the movement contemplates and you are simply asked to fall in with this general movement and participate in the efforts to secure such legislation.

Mr. Toole: I do not think we can discuss these things now, as it is getting so late. This was merely brought up as a suggestion and I would recommend that the society turn this over to the executive committee for such action as they may instruct the president and secretary to take.

Mr. Reigel: There is a question before this house that has been seconded, I have a motion looking forward to this after this was disposed of. I move you that this resolution as read may be laid upon the table.

Motion carried.

Mr. Toole: Then I will repeat, as near as I can, the motion I wish to make. We feel that it requires more consideration than we can give it now, therefore I move that this be turned over for the consideration of our executive committee and that our president and secretary take such action as the executive committee may recommend.

Motion to refer to executive committee carried.

The President: I would like to say that to my mind we have had a grand good meeting. It is my hope that the meetings in the future will be as productive of good as this one has been and with these hopes we now stand adjourned.

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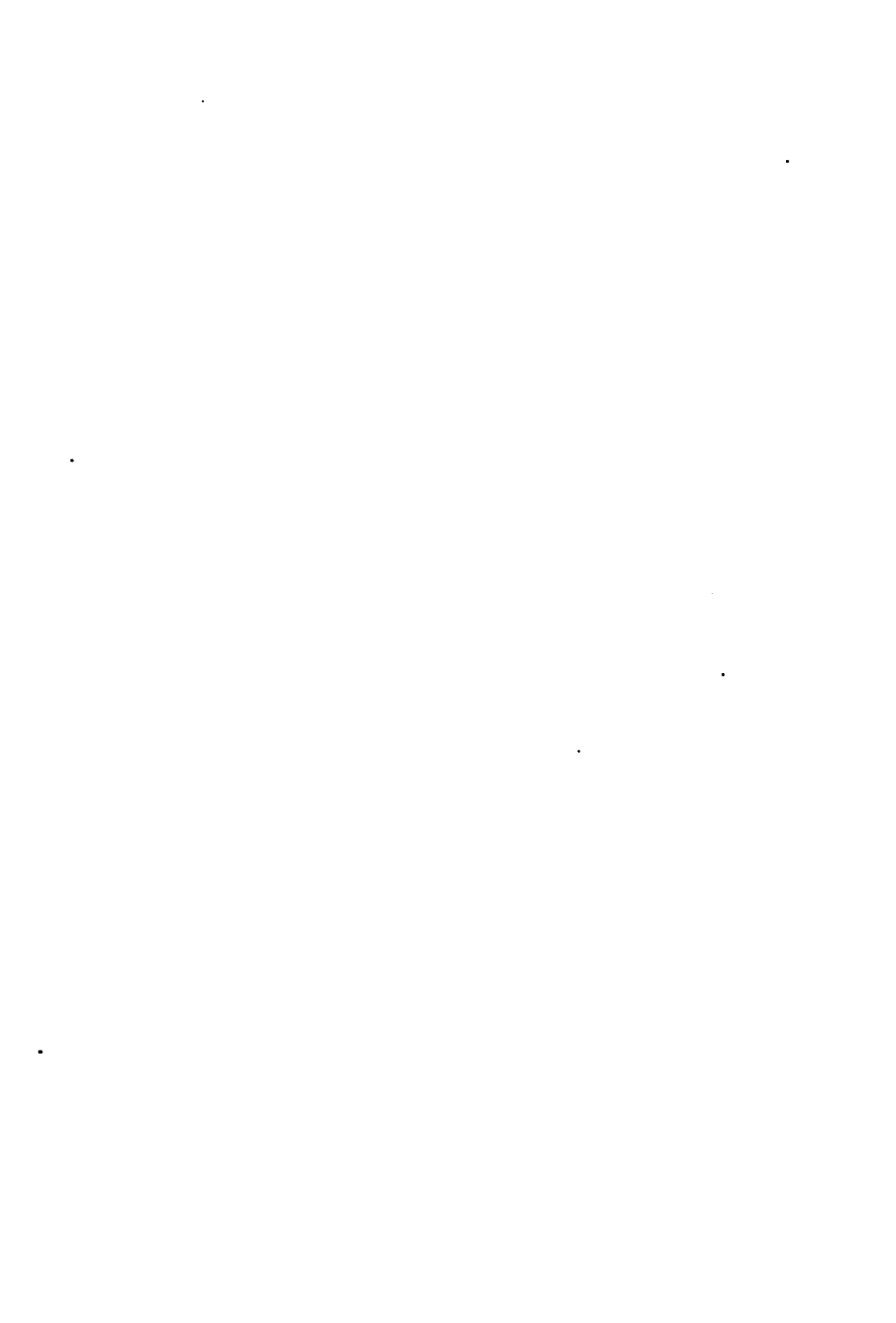
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THIRTY-THIRD ANNUAL REPORT
OF THE
WISCONSIN
Dairymen's Association

HELD AT

Wausau, Wis., February 8, 9 and 10, 1905.

REPORT OF THE PROCEEDINGS, ANNUAL ADDRESS OF THE
PRESIDENT, AND INTERESTING ESSAYS AND DISCUS-
SIONS RELATING TO THE DAIRY INTERESTS.

COMPILED BY

GEO. W. BURCHARD, Secretary.

MRS. A. L. KELLY, Stenographic Reporter.



MADISON
DEMOCRAT PRINTING CO., STATE PRINTER
1905

LETTER OF TRANSMITTAL.

WISCONSIN DAIRYMEN'S ASSOCIATION,
Secretary's Office,

FORT ATKINSON, May 20, 1905.

To His Excellency, ROBERT M. LaFOLLETTE,
Governor of the State of Wisconsin.

I have the honor to submit for publication, as provided by law, the thirty-third Annual Report of the Wisconsin Dairymen's Association showing the Receipts and Disbursements the past year, also papers relating to the dairy interests read and discussions had at the annual convention held at Wausau.

Very respectfully,

GEO. W. BURCHARD,
Secretary.

OFFICERS, 1904.

PRESIDENT,
CHARLES L. HILL,
ROSENDAL, FOND DU LAC COUNTY.

VICE PRESIDENTS.
HON. A. D. DELAND, SHEBOYGAN, SHEBOYGAN COUNTY,
President 1877.

HON. STEPHEN FAVILL, MADISON, DANE COUNTY,
President 1880.

HON. H. C. ADAMS, MADISON, DANE COUNTY,
President 1887-9.

PROF. W. A. HENRY, MADISON, DANE COUNTY,
President 1890.

HON. W. D. HOARD, FORT ATKINSON, JEFFERSON COUNTY,
President 1891-3.

HON. C. H. EVERETT, RACINE, RACINE COUNTY,
President 1894-5.

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President 1898-9.

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President 1901-3.

SECRETARY,
G. W. BURCHARD,
FORT ATKINSON, JEFFERSON COUNTY.

TREASURER,
H. K. LOOMIS,
SHEBOYGAN FALLS, SHEBOYGAN COUNTY.

HON. CHESTER HAZEN, RIPON, FOND DU LAC COUNTY,
President 1872-74. Died 1900.

HON. HIRAM SMITH, SHEBOYGAN COUNTY,
President 1875-76. Died May 15, 1890.

HON. H. F. DOUSMAN, WAUKESHA COUNTY,
President 1878.

HON. Z. G. SIMMONS, KENOSHA COUNTY,
President 1879.

HON. C. R. BEACH, WALWORTH COUNTY,
President 1881-82. Died September 15, 1896.

HON. W. H. MORRISON, WALWORTH COUNTY,
President 1883-86. Died December 15, 1893.

ARTICLES OF ASSOCIATION.

(Adopted February 15, 1872.)

ARTICLE I. The name of this organization shall be, the Wisconsin Dairymen's Association.

ARTICLE II. The officers of this association shall consist of a president, secretary and treasurer.

ARTICLE III. The vice presidents of the association shall consist of all past presidents.

ARTICLE IV. The president, vice presidents, secretary and treasurer shall constitute the executive board of the association.

ARTICLE V. The officers of the association shall be elected at the annual meeting and shall retain their offices until their successors are chosen.

ARTICLE VI. The regular annual meeting of the association shall be

held each year, at such place as the executive board shall designate.

ARTICLE VII. Any person may become a member of this association and be entitled to all its benefits, by the annual payment of one dollar.

ARTICLE VIII. The executive board shall have power to call special meetings whenever and at such place as in their judgment its interests so demand.

ARTICLE IX. The officers of the association shall perform such other duties as usually devolve upon the officers of like associations.

ARTICLE X. The treasurer shall have the custody of all moneys belonging to the association, and authority to pay out the same, whenever an order is presented, signed by the president and secretary.

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS

OF THE

Wisconsin Dairymen's Association

AT THEIR

THIRTY-THIRD ANNUAL CONVENTION

Held in Wausau, Wisconsin, February 8, 9, 10, 1905.

President Charles L. Hill in the chair.

The Chairman: The Association will please be in order. I hold in my hand practically all the property of the Wisconsin State Dairymen's Association. Three years ago at our meeting in Menomonie, among those particularly interested in the meeting was Senator Stout, whom you all know as having given to that town their manual training school, and the next year at Fond du Lac, through the courtesy of Senator Stout, there was sent from that school to the Wisconsin State Dairymen's Association this gavel, made by pupils of that school.

This opening meeting will be altogether informal, that we may become better acquainted.

ADDRESS OF WELCOME.

By Mayor E. C. Zimmerman.

Mr. President, and Ladies and Gentlemen of the Wisconsin Dairymen's Association: The city of Wausau is the center of one of the most populous and largest counties in the state. It is the seat of our county government, and by reason of its manufacturing establishments furnishes a ready market for the products of the farm. We therefore depend largely on our country folks and they depend on us. The city's progress is identical with that of the county, and it is more than a mere figure of speech, when I say that Wausau is the heart of Marathon county. Standing here as a representative of our beautiful, enterprising and pushing city, I feel that I have a right to welcome you gentlemen who are here to conduct the first convention of dairymen ever held in our midst, not only as I am bid, in behalf of the people of Wausau, but in a larger sense. I think I honestly voice the sentiment of the 4,000 honest and sturdy farmers of Marathon county, who have made it what it is, one of the richest agricultural districts in the state, when I, in their behalf, extend to you hearty greetings and welcome. I do so especially in their behalf, because you are here to speak on topics, interesting of course to all of us, but more particularly to them, and I have no doubt that they will soon learn the importance of these gatherings and the substantial benefit to be derived from them. We know that much of the progress made in the last fifty years in the mechanical arts, in engineering, in science and in all learned professions, is due to the association of men and minds, to the exchange of thoughts and ideas between men engaged in similar work. The men engaged in those professions, living in the thickly settled communities, in the larger cities, have long ago grasped the importance of frequent meeting for the purpose of enlarging their knowledge by discussing and exchanging their experience gained in many years of active life. So we have regular meetings of engineers, of architects, of machinists, of dentists and physicians, bankers, yes, of lawyers, which for some reason

they call "bar" meetings, and we have the many meetings of ministers of the gospel, where they advise as to the best method of making their congregations not only listen to, but also practice, the doctrines of Christ. It has been the farmer only who is neglected or who has neglected himself in this respect, partly because his field work did not allow him much time for mental speculation, partly because of necessity living apart, and cannot so readily meet as people living in the cities. The very fact that on that account he is much deprived of the opportunity of making other men's experience his own, is a sufficient reason that on some occasions at least, he should seek a chance given him for his mental and professional improvement. Farming nowadays is much different from what it was fifty years ago. Farming has become a science as well as manufacturing, and hard work alone will not always make a successful farmer, his work like any other must be guided by intelligence, which he can gain only by study; by studying the ground which he works, by studying the qualities of the stock, and the purpose for which it is raised, by studying the value of food for stock for different purposes, and the value of fertilizers which he uses or may use with advantage, and last but not least a study of the markets where he must sell.

The invention of labor saving machinery gives him now more chance for reading and learning, but nothing is more admirably adapted for mental improvement than public lectures. A farmer who listens to an interesting lecture and, as one would say, takes the words from the speaker's lips, is much more apt to retain them in memory than if he should read them in print. It is not to be overlooked that farming is still the greatest industry of our country; that the value of farm products exceeds by far the value of the products of any other industry, if it does not exceed the total value of them all. The dairy products are today one of the most if not the most important source of income of a very large percentage of the American farmers, and upon the intelligent conduct of that branch of agriculture depends in a measure his success. To make the farmer familiar with the best methods of conducting the dairy business and succeeding in it, to instruct him how to secure the annual output and at the same time increase its value per pound, is the object and purpose of this convention and we extend to you,

gentlemen of this convention, our most hearty welcome. I hope you will pardon me if I have inadvertently said, convention. I did not mean anything wrong. I know that conventions have become discredited in late years, but we like your convention nevertheless, because it will be so excellently managed, I should have said conducted, and because we know it will run so smoothly. Our farmers, and every farmer is a dairyman, and every dairyman is a farmer, will be glad to learn from you the difference in the milk of the different breeds of cows, which animal is best adapted for butter, which for cheese and which for beef, or which for all purposes combined, if a difference exists in that respect. I heard an old farmer frau once say that she liked her cows because, she said, "they give me back everything I give them." She was a thoughtful woman and there may be meaning in this homely phrase that needs explanation. I know that our dairymen will be more than pleased to listen to you gentlemen, especially to a practical gentleman of their own number, whose cow has given her own weight in butter in one year, and who has succeeded in coaxing an unwilling congress to protect the gentle American cow from the machinations of the beef trust.

Gentlemen, I assure you that of the many conventions which have been held here, and they were of all sorts, there has been none which we welcome with a greater degree of pleasure than yours, the convention of the Wisconsin Dairymen.

RESPONSE

President Hill: Mayor Zimmerman, kind friends of Wausau and Marathon county: It is very unusual for the President to be asked to respond to the address of welcome, and why the Secretary arranged it I do not know. Perhaps he thought I would feel more than others, who had not come so far, the welcome of this Association. I was up here in the fall to make some preliminary plans for this convention, and I not only had the assurance in words but in actions, that the members of our

convention would be most welcome indeed. So I realize that the welcome given by Mayor Zimmerman is not of the city alone, but, as he says, of four thousand farmers of this, Marathon, county.

When we first talked of having this convention, several places were suggested, and I said that I honestly believed that Marathon county has in it greater possibilities as an agricultural county than any county in the state. I think that we who have come here, when we examine those samples of soil that are down in the exhibit room, taken from different portions of the county, will realize why you have such wonderful possibilities. Some of the counties farther south in this state, and perhaps even farther north and west, have a large proportion of their territory taken up by stony or sandy land or land with gravelly subsoil, but you in Marathon county, as I understand, have nearly every foot of your land good land, except this small Wisconsin river valley. It has been my privilege to drive through different sections of Marathon county, and while I may not realize its possibilities as you do here, I am sure that even you do not yet realize what is in store for this county.

This Wisconsin State Dairymen's Association comes to you today not as teachers, but as learners. We have come here to talk over in your presence and with you these topics which are of so much importance to us all. Marathon county is known throughout the state in many different directions, one of them being the new Marathon County Agricultural School. We are very glad to be able to receive the welcome of the schools and to see some of the students taking part in this opening session.

It was my privilege to look over the plant of the Marathon County Dairy Company last fall, and it is a model plant in which I am sure you take great pride. I was glad to see that the milk received at that plant shows a very high order of dairy farming in this part of the country.

The Marathon County Agricultural Fair is one of the few that are noted throughout the length and breadth of this state, and further, as an agricultural fair, a fair that should be of the greatest benefit to the farmers and bring the farmers and the city people together, for as Mayor Zimmerman has said, the city people depend upon the farmers.

I realize that you people call this country the "Clover Belt," and aptly so, and we who come from considerable distances are glad that we are going to hear at this convention all about the possibilities of this country, and particularly with reference to the clover culture.

There is another thing that is going on at this time in this county that is interesting, and that is the continuous test of a pure bred cow that has already made a better record on twenty-five cent butter than any other cow in America, and promises still greater things. I think you can almost surely say that Marathon county is going to hold the world's record as a butter test, and you know who owns that cow, Mr. Frederick Reitbrock of Athens.

On behalf of this Association, I thank you good people for this kindly and hearty welcome. We feel that you have not only spoken it, but that you feel it toward us, and I hope that in the sessions of the convention that will follow you are going to feel just as free to take part as the speakers who have come from abroad. This is your convention and you have as great a right to a voice in it as any one else. Let us learn from one another while we are here so that we may all go away benefited for having been here. Personally, I never attended a meeting of this Dairymen's Association without going home feeling a greater consideration for the work on the farm, feeling a strong desire to do better work, to excel my past year's work, and I hope we shall all go away from this convention feeling this way. Again, I thank you.

GENERAL GREETINGS.

C. H. Everett, Racine.

Mr. President, Gentlemen of Marathon County: It certainly gives me great pleasure to be here this morning and to note the prosperity of Marathon county, to note its increase in prosperity since my last visit to the county seven or eight years ago.

While I am not now actually engaged in farming work, I am nevertheless watchful as ever of all agricultural interests in the state, and I know fairly well what is going on in this county among you farmers. I know of your soil, your good climate, your good water, your good grasses, etc. I know that your county is well adapted to dairying, especially to cheesemaking and butter making, and I know also that you have many good farmers and that you have good cows. I know further that some of you farmers seem to lack in "know-how"—that is a good way to put it. They have cultivated the soil well, perhaps a little better than the mind; what we are here for today is to cultivate the mind. It is an easy thing to plow, to harrow, to sow and to reap, but we must know why we do these things. It is an easy thing to feed a cow, but it is not quite so easy to know what she pays back for the feed that we give her. We are too apt to feed a lot of oats and corn and hay and bran to a lot of cows and take what they give back in return, to take the check from the creamery, grumble a little perhaps at the price of butter fat and perhaps more liable to try to remedy the price than to apply the remedy to the other end of the business, that is, get a cow that will return more for the feed. Now, if farmers had to feed money to cows instead of corn and oats, they would be more particular as to what they got back, and yet there isn't a particle of difference. You take a bushel of corn and a bushel of oats and fifty cents worth of hay, say, \$1.50 worth of feed, and place it here on this end of the table, and \$1.50 in money over there, is there any difference? The feed will buy \$1.50 and the \$1.50 will buy the feed. They are of equal value, no matter whether you raise them or procure them in the markets of the world. Now, isn't it the business of a clear-headed, shrewd, wide-awake dairyman to know what he is getting for that \$1.50 in money that he feeds his cows? That is the proposition that is up to every Marathon county dairyman, as well as every other dairyman, it is a business proposition.

We have all kinds of cows, as well as all kinds of men. We are apt to speak of a dairy cow as a machine into which we put a certain amount of feed, and we know that we can not get milk from her without first putting feed into her mouth. What kind of dairy machines have you got in this county, and are you sure that they are returning to you \$1 for every dollar's worth

of feed that you give them, or 90 cents for every dollar's worth, or \$1.25 for every dollar's worth? That is a proposition for you to decide, for you to study out for your own good.

Life is short; we do not live a great while any of us, we do not own any of the land that we occupy. We are simply tenants for life; we ought not to be narrow and starve out, get all that we can personally out of the land, out of the farm, and let those who follow take care of themselves. It seems to me that we ought to try to be broad and intelligent, and cultivate the land, do what we can for ourselves and at the same time look into the future, leave the land in as good condition at least as we found it, and intelligent dairying will do that on any good soil. We ought to be liberal, broad-minded business men. I want you to study the questions that will come before you at this convention. Every skillful dairyman has to study these questions. I have been in the dairy business for a good many years and had to study out these things for myself, and I got a good deal of help from meetings of this kind, and still when I went back home to the farm it was myself who had to apply the lessons that I had learned elsewhere, so far as they were applicable to my condition, and such will be the case with you. This is your meeting, it is not ours. I hope you will make the most of the opportunity. We shall be glad to help you all we can, to exchange ideas with you and give you practical suggestions and lessons in return for your experience. I thank you.

Hon. W. C. Silverthorn of Wausau.—Mr. President and Gentlemen: When your Mr. Wright asked for the use of this court room, he seemed to have some hesitancy whether we would give up the use of the court in this room for the convention, and yet I do not know why he should hesitate, because perhaps he is aware, that although I had been a great agriculturist, I had been upon the bench so long, he perhaps feared I had lost some appreciation for agricultural pursuits. But I assure you that it is with great pleasure and with considerable pride that I feel

now that I could not have done better, or devoted this room to a better purpose. I see that in the manifestation you have already given of the purposes for which you have convened, and I welcome you most cordially and concur in the sentiment expressed by Mayor Zimmerman and second that welcome, not only here in this room but to the city and to the county, so far as I am able to do so as a citizen and an official.

I was raised in Wisconsin, although born in Canada. I spent my boyhood days in Jefferson county, and finally adopted my local habitation and home in Marathon county, and have been here nearly two score years, and it is with great pleasure and satisfaction that I hear this county and this locality spoken in such terms of praise, and, I think, just appreciation. I wonder how the great transformation has come about that the pursuit of agriculture has come to rank so high as it does today, not only here, but throughout the American continent. A farmer does not now seek, as he did when I was a boy, to hire so many hands. Why the use of the word "hands?" We would sooner say "men." We want so many men, although we appreciate hands perhaps as much as ever, but we have the machinery today that does much of the hard work; but no machinery can do the work of the head, and so the people of the country have come to realize that they must cultivate the head, and for that reason they start out young men in the pursuit, not only of cultivating their own heads, but assisting in cultivating the heads of others, establishing agricultural knowledge and diffusing it throughout the land. Not only here, but elsewhere, the pursuit of farming has grown to be the first, as it is the most numerous. Over in Canada, a few years ago, I picked up one of the papers, after listening to the remarks of quite a number of people gathered together at a sort of a fair, and in that paper I found a little poem that I cut out and pasted it into my memorandum book, and for want of saying something better or nearly as good, I will read you that bit that I cut out, which voices the sentiment expressed here. This is entitled "The Farmer".

“THE FARMER.”

“The king may rule o’er land and sea;
The lord may live right royally;
The soldier ride in pomp and pride;
The sailor roam o’er ocean wide,
 But this, or that, whate’er befall,
The Farmer, he must feed them all.

“The writer thinks, the poet sings,
The craftsmen fashion wondrous things.
The doctor heals, the lawyer pleads,
The miner follows precious leads,
 But this, or that, whate’er befall,
The Farmer, he must feed them all.

“The merchant, he may buy and sell;
The teacher do his duty well;
But men may toil thro’ busy days,
Or men may stroll the pleasant ways,—
 From king to beggar, whate’er befall,
The Farmer, he must feed them all.

“The farmer’s trade is one of worth,
He’s partner with the sky and earth,
He’s partner with the sun and rain,
And no man loses for his gain,
 And men may rise and men may fall,
But the Farmer, he must feed them all.

“The farmer dares his mind to speak,
He has no gift nor place to seek,
To no man living need he bow;
The man who walks behind the plow
 Is his own master, whate’er befall,
And king or beggar, he feeds us all.”

The sentiment, I am sure, is the sentiment that appeals to every man here. I have noted it in your countenances, I have

noted it in the sentiments that have been expressed, and I repeat again that you are not only welcome, but you have made us all feel proud to receive you here in our midst. I wish you many, many years of prosperity and health, and that you will return again to our midst.

W. D. Hoard, Ft. Atkinson: Mr. President: An old Indian once said to me, "White man heap talk. Indian heap think." The winter time is the talking period in agriculture. We work all summer and think and study and plan, and then in the winter we come together and gossip over it, and Tom says to Bill, and Dick says to Harry, and John says to Sam, "How did you do it?"

There is a great deal of importance in the character of the meetings that this Wisconsin Dairymen's Association has been having for thirty-three years. This is the thirty-third convention; and I want to say, I never in all those years—and I have attended every meeting but one—I never saw as cheery a spectacle before me at the opening of any convention as I see here in the faces of these boys. I never saw a lot of boys come together at our opening meeting before. Verily, we have fallen upon an awakening period in the mentality of the farmers of Wisconsin, when boys will come out and enjoy a meeting like this. I know what it is due to; that you have organized yourselves in Marathon county, and I know that the whole state is suffering for lack of this county organization.

Men are like grains of sand, they are like a rope of sand. All there is to that which we call civilization today as against barbarism, all there is of the superiority of the white man over the Indian, who once was the sole ruler of this country, all the difference lies in that one word, "organization;" all the difference there is, all the superiority in civilization over barbarism, is in the co-operation of men together. The white man co-operates; the white man works together; the white man organizes; organizes in the form of government, into township and county and state, going down to the last unit in school districts. The Indian never organized, but the Indian sat still and thought and didn't do anything more than think.

Now, you have done a great thing in Marathon county, and I want to say here that nothing has ever occurred in the history of my state that gave me more cheer—I am on the down hill side of life, I do not expect to be cheered a great many more years—nothing has ever given me more comfort and cheer than the fact that Marathon county and Dunn county organized in their midst a center, like the building of a fire, and that fire shall warm and cheer and invigorate the thought of the whole county in the way of intelligent teaching of principles that apply to the well being of this and every other community.

Men take a cheap view of agriculture and a cheap view of farming. Farmers, more than any other set of men on earth, have cheap fixed ideas concerning themselves. Go out here on any farm almost in this county—a few weeks ago I was up here talking to a body of farmers, and I was impressed that the farmer takes a narrow, cheap view of himself. He doesn't think he is much of man unless you tell him he isn't, then he gets mad and thinks he is; but he doesn't think he is very much of a man, and he doesn't think much of his business and he doesn't think much of his place in society. He is mistaken. The old Persian courtier said to his king, when the king was about to bestow a great honor upon him, the king said, "What shall be the measure of the honor I shall give to you?" And the courtier said to him, "Honor me as I honor thee."

Now, to every farmer living out here on his farm and confronted with these hard problems and doing his work and thinking that the world does not pay any attention to him, yet in every single farm home in this state is the problem of law, the great problem of mastership of mind over matter, the mastership of the head over the hand, of the head over the problem of the farm, and so—you have in Marathon county established this school. Why? That these boys may start a little better, with a little more advantage in knowledge and understanding. Judge Silverthorn has spoken of Canada. I have lectured in all the provinces from Manitoba to the Atlantic ocean. I have been wonderfully impressed with the work that is going on in Canada. There is one man in Canada that is doing a marvelous piece of work, Sir William Macdonald of Toronto. He has devoted a fortune of nearly \$3,000,000 to the education of the boys of Canada, and he has put that money into the hands

of my friend, Prof. Robertson, and now he is educating in manual training over 8,000 boys like these boys I see before me. I spent a month with Prof. Robertson, going from one manual training school to another and seeing what was being done with those boys in leading them up so they can see a little further. A man down at the bottom of a well can only see a small circle of the sky above him. Lift him out of the well, and he sees a little further. Put him on top of a hill and he sees still further. That is the reason for education and thought and study—it don't make you any more of a man than your mother made you, and no living man on earth, nor any school or anybody else, can make you any bigger than your mother made you. But what does it do? It simply takes you and gives you a little higher stand so that you can see further, a wider horizon, and so there is no such thing as higher education.

We have fallen into a foolish habit of talking about higher education. There is no such thing; there is a wider education, when a man gets where he can see a little further; that is all. The altitude where you stand is the important thing, not what you get. What you get is width; you see more; you think more; you study more, you believe more, and you have more faith and you do more.

Old Judge Conger was a queer old fellow, and he told me one time, in talking to me of the difference between the way men face their work, that some men were opposed to more things than they were in favor of. Now, think of that, boys; just think of that; some men are opposed to more things than they are in favor of. You never saw that kind of a man ever do anything. But the man who is in favor of more than he is opposed to, is the man that reaches out and does something all the while.

Now, Sir William Macdonald is reaching out to take hold of the country school districts of Canada, and by the help of the government he is going to put his money into it. He is going to organize all the country school districts into groups of ten, and every school district is going to take a half an acre of land and attach it to the school house, and the school district is going to manure that land and plow it and harrow it and put it into condition every spring, and then Sir William Macdonald is going to send a teacher and that teacher

is going to that little country district school to spend half a day in each week and each teacher has ten of those schools, each boy has got a plot of ground and each boy is going to learn how plants grow; how corn grows; how oats grow; how timothy grows and how other stuff grows. He is going to study physiology and biology, plant life as it attaches to the farm. Now think of it, Mr. Goodrich and Gen. Burchard and President Hill and myself, and every other old fellow here, think what a big lift that is going to be on the future history of that boy; how he is going to come to the farm when he has had a chance to know what it means, how plants grow. I came up as a farm boy and all the chance I had was to try to make things grow without undertaking to know anything about how they grew, and all these old farmers have come up in this way, and the state never has done anything in God's world for the farm schools out in the country. It has never done anything to help the farm boy know anything about these things, but it has spent money galore in making doctors and lawyers and members of all the professions, while it has let the farm boys grow up with all these great problems before him and never paid a dollar to the country school, and that is the farmer's school.

Today we are just on the verge of an awakening of thought and judgment and conscience, a sense of justice in the people, and we must do something in this matter, we can't help ourselves, because the conviction is pushing the state right along.

See what Canada is doing! Now, Canada doesn't pay any attention to the old farmer. They have to quit pretty soon, and besides that you can't teach an old man much, I know that. It makes me think of a story I heard down in Illinois. An old farmer had a horse and the horse was very sick, and the boys were fussing with it and the old farmer looked at the horse and by and by the old farmer said, "Boys, 'tain't no use to give him physic, his eyes is sot." That is the case with us old fellows—our eyes are "sot," and it ain't much use to bother with us. But the farmer that is to be, the farmer that is coming like these boys here, the future of our state, its ability, its capacity its growth, its understanding, and more than all things else, the saving of the fertility of our soil, that must come by the educa-

tion and culture and understanding of the young man that is going to be the future farmer.

Oh, I could tell you stories of the destruction of American farming. I have studied it from the Atlantic coast to the Rocky Mountains. I have seen going straight along that every step the American farmer has taken from the Atlantic coast to the Rocky Mountains, has been a destruction of two great things, and those are forests and fertility. Do you know what that means? It means that the state of Indiana today is poorer by fifteen dollars an acre on her land than she was thirty years ago. It means that the state of Ohio is poorer by twenty dollars an acre than she was thirty years ago. It means the state of New York has lost in thirty years fifteen hundred millions of dollars by the decline of the value of her farm lands. Now, don't you see what education means? The saving of the state, and I tell you that education means not only that you shall put a little more money in your pocket, but it means you shall save the productive fertility and the productive power and the productive strength of the state. These things are practical, they are not chimerical, they are not visionary, there are not theory, but they appeal to the very foundations of our society, and you in Marathon county, have builded wiser than you knew.

I wish I had the whole county before me today that I could say to them what I believe concerning what you have done here. You have not only done something for your own pride and that of the future farmers of your country, but you have established an example. We have tried to get a school like this in Jefferson county and our farmers have shut their eyes and they have been penny wise and pound foolish and they have been questioning about taxes and all that, and they have refused to have such a school. But it is coming, we are going to keep after them until we establish this foundation as you have done in Marathon county. I congratulate you on what you have done.

Twenty-five years ago I came into this county at the solicitation of Mr. J. M. Smith. He wanted me to advertise some of the land of this county, and I didn't want to do it until I knew myself whether I was misleading my readers or not. So I came in here and spent a week traveling over this county, and out in the town of Stettin I looked at the soil and I made up my mind that Marathon county was, as far as I could see it,

a county of splendid answer to the hope and labor of the farmer, and I went home and said what I could to our people, "If you want a change, if you want to better your condition, if you want to do something for yourselves in a different way, do not go to Dakota, do not go off to the west, keep in our own state, go up in Marathon county and Clark and these other counties."

Now, then, these things have come and the things today you might call fruit of the very blossoms I saw twenty-five years ago.

These things interest me much. I have loved my state; I have given to it the best of my life, and I hope to give it more, but I love to see the thing grow. I am a good deal as the boy was when he put twenty-four eggs under the old hen and his mother said, "Why, Tommy, why do you put so many eggs under the old hen?" "Mother," he says, "I like to see the old thing spread herself."

The Chairman: I am sure that I read in all of your faces, and especially those of these boys, an appreciation of these views expressed by our ex-Governor Hoard. He says that twenty-five years ago he came into this county to look up its agricultural possibilities. Some few years previous to that, I think a matter of twenty-eight years ago, when but very few were even beginning to think of Marathon as an agricultural county and the one product that Marathon county people were talking about then was logs, always logs. But not every man was blind to its possibilities as a farming country, and twenty-eight years ago last summer there came here a man who had become interested in lands here and walked many miles, I don't know how many, forty or fifty or sixty perhaps, through the woods with the one idea in mind of looking up the future possibilities of this country along agricultural lines. You know something of the impressions made at that time upon that man's mind and of the work he has done since, and we would like to hear from Mr. Fred Rietbrock for a few moments.

Mr. Rietbrock: Mr. President and Gentlemen, what the president has told you is true about my coming here and stay-

ing during the five growing months of the year to see how things would grow. The secret of my coming was to see whether the country was good for anything for people to go into who had a precarious existence in the city. It was following the hard times of 1873, the people through the country and particularly in the cities were practically "busted." Many men were working for sixty cents a day and only four days in the week, to keep hundreds and hundreds of families. In the country many of the people have no idea, are very little informed in regard to how things are in the cities, and yet many of them have a strong inclination to get some kind of a job in the city. Many of our boys want to get on the railroad. They know that S. S. Merrill and a few others have worked themselves up perhaps from brakeman to the position of general manager or president of a great railroad system. They don't stop to think that that great railroad system having perhaps tens of thousands of miles of railroad and handling millions of money can only have one president and that he generally holds on for a long time, and there isn't much chance for a boy to get that place; but still our boys have a secret inclination in that direction, and how splendid it is to be a brakeman, standing up on top of a freight car running at the rate of thirty miles an hour, with his coat-tails sticking out behind, hanging on to a wheel on a cold morning, with the thermometer twenty-five degrees below zero, with a remote prospect of being a president, while we as agriculturists, —I was a farmer when I was on earth the first time, then I got off for thirty or forty years, didn't pay very much attention to actual farming, but I am after it now on my second heat. But of one thing I am more powerfully convinced than everything else, and that is in looking over the whole field of human endeavor, that the farmer holds the middle position. The opportunity is not great for the farmer to increase his wealth up into the millions, but there are many farmers who have in the period of their activity worked up to a hundred thousand dollars and there are but few but what have made a fine living as they went along. Beyond everything else, it is the place of independence. It is the place where want does not creep in if the farmer works with some degree of diligence and some little intelligence. While you do not find millionaires among the farmers, you do not find that abject poverty and great want and scratching

around to get bread to keep life in the body that you find in the large cities. And yet, strange to say, many of those men that you see suffering in the cities came from the farm. It has been said, and I suppose truly, as an observation of the wise men, that the fourth generation from the men of brain and muscle who come from the farm to the cities, runs out into nothingness. If the young men will only think of these things, catch hold of the idea, I think they will make up their minds that after all the farm is a good place for them, because it is there they can put themselves beyond want, but there they will find a comfortable subsistence, a comfortable condition of independence, far more so than in the city, and I say that although I was not an absolute failure myself in the city. Indeed, I worked up a very good income from my profession, though that profession was that of getting other people out of trouble, and perhaps some in. I was simply a hired man for other people all the time. I had nothing of independence, no scheme that I could work out in my life time and I didn't like it as I like farming. It was not a hard job for me to jump out into the country. In those days I used to run out of the city two days of the week and that gave me an opportunity of running through Marathon county. I had heard that there was lots of sand up there, but there were patches of good land and I wanted to see what it was, and that is how I came to come here, and I must say I have taken great pleasure in that part of my life in coming here. I know that the people of Wausau and a good many people of Marathon county seem to be quite friendly to me, and we haven't gone back on each other very much. I have been in nearly every northern county of this state and I didn't find anywhere else such a tremendous stretch of territory as exists here, extending to the east and the west, of good land, and the land is what we have to have when we start farming. The time was when Uncle Sam had a farm for all his sons, but he hasn't it now. The last patch he had was the Rosebud reservation, which he acquired from the Indians and put it on the market, twenty-six thousand quarter sections, and 125,000 filed claims for that land. Uncle Sam has squandered his land in a short lifetime. I heard a man talk just a few weeks ago who has charge of a farm of 300,000 acres in Texas, and there are many farmers in the west having 10,000, 20,000

acres, but the time is coming when they will all be cut up into farms of convenient size. Uncle Sam's big domain is scattered and people are coming to realize it. It is the farming communities that sustain the government and feed the people.

Now, I believe that the Dairymen's Association will have a good meeting here, and I hope that those who come from the southern part of this state will be interested in the style of people we have here. Some of our people understand rolling logs better than they do farming, but their boys will learn the other trade and make good farmers. I thank you, gentlemen.

The Chairman: We regret very much that our Treasurer, Mr. Loomis, who has served so many years, will not be with us on account of the illness of his wife. In his absence, I will appoint Mr. Rietbrock as Assistant Treasurer.

Adjourned to 1:30 P. M.

AFTERNOON SESSION.

The convention met at 1:30 P. M.

The meeting opened by the President and Mr. C. P. Goodrich called to the chair.

PRESIDENT'S ANNUAL ADDRESS.

In opening this the thirty-third annual meeting of the Wisconsin State Dairymen's Association, it is with a realization that a third of a century has passed since its organization at Watertown in 1872.

Of the pioneers who founded it, only Gov. Hoard, H. C. Drake and Uncle Stephen Favill remain with us. We younger men realize more fully each year, how far sighted was their work, and they builded even better than they knew.

The influence of these men increases as the years pass on, and

none of us yet realize what is before the dairy industry of Wisconsin.

This was the pioneer organization of its kind in the west, and is recognized as the leader of such associations all over the country.

Largely as a result of the work of this Association, Wisconsin stands second as a dairy state, of all the states in the union, and but a short time will elapse before it is far in the lead of all others.

The Farmers' Institutes of the state were also an outgrowth of its work, and the dairy school at Madison calls this Association its alma mater.

I commenced to attend the meetings of this Association in 1888, and have missed but two since that time, and any success that may ever come to me as a dairyman, I can truly say will be due to the influence of the older members of this Association and to their kindly consideration, and unselfish use of knowledge, born of experience.

In assuming the duties of President at this time, I only do so because I realize that younger men must take up the work that these pioneers are laying down, and we must learn to unselfishly work for the welfare of others, as cheerfully as they have done.

Another thing that tends to show the advanced dairy thought of the state as fostered by this Association, is the fact that in the work of official testing of the different breeds of pure bred dairy cattle, the breeders of this state have been in the front rank, not only in the number of cows tested, and in the size of the records, but also in working for revisions of the rules that will call for tests of more value to the dairy public.

Some years ago a certain live stock journal took occasion to sneer at the fact, styled by it, "The Wisconsin Idea," that in this state, more than any other, the farmers were beginning to realize that the cows to be good producers in the dairy, must be dairy, and not beef cows, and bulls to sire such cows must also be of strictly dairy temperament.

Results of the winnings of Wisconsin cattle in prominent dairy shows, and tests since that time have vindicated our position, and silenced all critics.

The results of the cheese exhibit at St. Louis prove that by the more than thirty years of constant effort directed and led by this

Association, Wisconsin now leads the world in the quality of her cheese, and we must so value, and strive to increase this reputation that it will be impossible for any competitor to overtake us.

At the same time the reputation won by Wisconsin butter at St. Louis was not nearly so enviable, but with the system of inspection of which I shall speak a little later on we can reasonably expect to make great strides forward in this direction.

In 1850 New York had 931,324 cows, while Wisconsin at that time had but 64,339; in 1900 New York had 1,501,608 and Wisconsin's number had grown to 998,397, or practically two-thirds as many as New York, and at the present rate of increase, in the two states, Wisconsin will soon be in the lead.

In 1870 New York had 308 cows per thousand of population, in 1880, 283, in 1890, 240, and in 1900, but 207, showing a constant decrease.

Wisconsin had in 1870, 292 cows per 1,000 population; in 1880, 364; in 1890, 470; while in 1900 we had 483.

Only the two states of Vermont and Iowa excel us in this respect, and in the ten years from 1890 to 1900, Iowa lost 146 cows per 1,000 population.

While according to the census of 1900 Wisconsin stood third in the list of states in the total value of dairy products sold from the farm, standing a good ways below New York, and slightly below Pennsylvania in this respect, still the much lower prices of feed prevailing here would make the net return look like quite another matter.

Wisconsin's nearness to the feed bins of Minnesota and the Dakotas, and her ability to raise cheap forage crops guarantees an ever increasing dairy industry, combined with high net profit.

As I remarked in the response to the address of welcome, few of the farmers of the United States, or even those of southern Wisconsin, begin to realize the dairy possibilities of northern Wisconsin.

This is indeed the "Clover Belt," not excelled, or even equalled in this respect, by any territory of equal extent in the union.

Corn for silage is successfully grown even in the extreme

northern part of the state, and a large per cent of the land well adapted to dairying is still in an uncultivated state.

The mining and lumbering towns of northern Wisconsin and the upper peninsula of Michigan afford from year to year an ever increasing market for all that we have to offer in the line of choice dairy products, especially milk and cream for daily consumption, and the demand will increase faster than the supply if we only give them good goods.

St. Paul and Minneapolis derive, and will continue to do so, a considerable portion of their dairy products from Wisconsin.

With the low price of these lands, and their high quality, in no other place in the union is there so good an opening for the beginner in dairying, or the expert as well.

This Association has always maintained that all products should be sold on their own merits, and for this reason had always joined in the efforts to compel the sale of oleomargarine for just what it is, and as it is reported that a repeal of the present oleo law will be attempted in the present session of congress, we will be found as heretofore fighting for our rights in this matter.

The different departments of dairy work in Wisconsin will ask for increased appropriations from the present session of our legislature to push the work all along the line, and have the assurance that they will get about all that they ask for, because of the excellent use made of all past appropriations.

I wish to call your attention at this time to some of the needs of the different departments, and urge your hearty co-operation in securing the necessary appropriations to carry forward the work.

The State Dairy and Food Commissioner, Mr. Emery, my very worthy predecessor in this office, has been for the past three or four years giving a great deal of attention to the need of more efficient inspection of creameries, cheese factories, and sources of city milk supplies in our state, and in his report to His Excellency the Governor, I find the following:

"I strongly recommend and urge that legislative authority be granted to appoint (1) a second assistant commissioner at a salary of \$1,600 and expenses. I believe the law should specify that he be an expert creamery butter maker, skilled in all the technical work of creamery butter making, a practical and

competent judge of creamery products, and versed in modern scientific and practical dairy knowledge.

(2) Eight cheese factory, dairy and food inspectors at a salary of \$1,200 a year and expenses. I would have the law specify that each of them be an expert cheese maker, skilled in the technical work of cheese making, a competent judge of cheese factory products, and versed in modern scientific and practical dairy knowledge.

(3) Six creamery, dairy and food inspectors at a salary of \$1,200 and expenses. I would have the law require that each one of these possess the qualifications herein specified for the second assistant commissioner.

(4) A chief food inspector at a salary of \$1,200 and expenses.

I would have the law specify that the chief food inspector must be a person skilled in the modern grocery business."

The governor in his message has said: "I recommend that the dairy and food commission be provided with a force sufficient to furnish adequate inspection for the cheese factories, creameries, and city dairies and thus put Wisconsin second to none in the protection afforded to her citizens against adulterated food products.

"The efficient inspection of cheese factories and creameries calls for expert knowledge and technical skill of a high order.

"Therefore, a law providing for this inspection should provide that to be eligible to the office, each cheese factory, or creamery inspector, should be an expert cheese maker or butter maker, a competent judge of cheese factory, and creamery products, skilled in all the technical work of cheese factories and creameries and versed in modern scientific and practical dairy knowledge."

With the hearty co-operation of all interested a sufficient force of inspectors is assured that will more than any other one thing at this time aid in enhancing the quality of Wisconsin's dairy products.

Wisconsin has been way behind other dairy states in the matter of dairy inspectors and we should be in the lead.

With our 3,000 creameries and cheese factories but four inspectors have been at work, three of them under pay of this

Association, while in the neighboring state of Minnesota with but 850 factories they have 14 inspectors.

The province of Quebec has 1,500 factories and 50 inspectors.

These are but examples of many other states and provinces.

On account of the great need, this Association has been spending a larger proportion of its funds for inspection and instruction work than we felt really justified in doing, and the appointment under pay of the state of a competent corps of inspectors will make it possible for us to do a little more aggressive work along some other lines.

Prof. Henry, as dean of the Wisconsin College of Agriculture, will ask for another instructor to aid Prof. Farrington in work at the dairy school, and one for increased work with dairy cattle.

Wisconsin owes to this school a debt for the Babcock test alone more than it can ever pay.

The Dairy School is a monument which this Association is proud of, and it will pledge its support in urging the granting of these additional instructors.

As a breeder, the work of one man asked for especially appeals to me and this is a man who shall have in charge the work of the supervising of the official testing of pure bred dairy cows.

The salary and expenses of all inspectors are paid by the owners of the cows tested, or by the breed associations, but the Wisconsin Station as well as nearly all others in the United States agree to supervise such test work.

As was previously mentioned, this work has grown greatly, and now requires practically half of Prof. Woll's time, which should be given to other things.

It is now proposed to have a man specially for this purpose, and who shall be in constant touch with the breeders of the state, and who shall be able through the press and personal effort to greatly aid Wisconsin to be the leader in the quality of its pure bred dairy live stock.

This will be of direct benefit to every dairyman, and will I am sure have your hearty support.

In closing this address, I wish to urge upon every one of you the motto "Forward" in all our work for Wisconsin's dairy interests.

Chairman Goodrich: The President, in his address, has touched upon one very important point, and that is the inspection of creameries and cheese factories. That inspection should also cover the farms of those who produce the milk. There is a bill before the legislature to provide such a system of inspection, and we ought to do all that we can to forward it. I spent some time in Canada in studying their dairy work. We have been told that they get two cents a pound more for their cheese than we do in Wisconsin. Wisconsin people some of them say that we make just as good cheese as they do and that they have some sort of a pull on the English market, and I didn't know but that was so till I went there, but I tell you their cheese is better. Not but what we make some good cheese in Wisconsin, just as good as theirs, but theirs is uniformly good; and what makes it? Twenty-nine inspectors in the province of Ontario, who not only inspect the factories, but inspect the milk and the farms, the way they are kept in order, and if a farmer doesn't keep them in good order and produce good milk, he is told, "You can't bring your milk to this cheese factory and you can't take it to any other, until you have reformed your methods." That is the reason why they have better cheese and why they get two cents more than we do.

It seems to me there is some work for a committee on this address of the President on several points, and I will appoint as such committee, Mr. Fred Rietbrock and W. D. Hoard.

The President resumes the chair.

WISCONSIN'S DAIRY PRODUCTS AT THE LOUISIANA PURCHASE EXPOSITION.

H. K. Loomis, Sheboygan Falls.

(Read in the absence of Mr. Loomis by Secretary Burchard.)

Mr. President, and Members of the Wisconsin Dairymen's Association: When I think of the lack of interest manifested by the cheesemakers, cheese dealers and dairy farmers in the exhibit at the St. Louis World's Fair, I have but little hope of interesting this audience with this subject.

Undoubtedly there are many present who attended the great Exposition, the most wonderful the world has ever seen, and while there, you probably visited the Agricultural building that covered twenty-one acres with over eight and one-half miles of aisles. Under this roof was gathered such a display of agricultural products, agricultural machinery and dairy products as had never been seen under one roof before. These products were gathered from all parts of the world, giving people an opportunity to study and learn not only of our own country but of foreign countries, enabling them to see, in a short time and at little expense, what would cost them thousands of dollars and years of travel. In this great Agricultural building, with its thousands of attractive exhibits, none attracted so much attention as the dairy. The ornamental display of butter by the different states was far better than has ever been seen at any exposition. Minnesota, Oregon, Washington, Missouri, New York, Kansas, Iowa, Illinois, Connecticut and Wisconsin had fine ornamental displays. I will only describe our own exhibit.

These exhibits were in refrigerated cases, with plate glass fronts. Wisconsin was limited to sixteen by eight feet, it being on the corner gave us the advantage of an end view. Eight feet of this space was taken up by a life size figure of a cow, of the dairy type, with a dairy maid standing by her side, one hand resting on the cow and the other holding a pail. This cow and maid were modeled in butter. The contract for this design was let to Mr. Beil, a sculptor of Milwaukee, but the work was done

by two sculptors from Paris who had been employed by the Exposition Company. This was truly a work of art. Every line and curve was perfect. Many times each day I heard this expression: "Here is Wisconsin's butter cow!" Many people from different states informed me that their neighbors and friends who had attended the Exposition said to them: "Don't fail to see the Wisconsin butter cow."

The remaining eight feet of space was taken up with print-and tub butter, placed on glass shelves with nickel plated supports. On top of these shelves was a fac-simile of our State Dairy School building, in butter. These also attracted a great deal of attention.

The managers of the Exposition offered awards on butter as follows:

To all exhibitors of butter who exhibited at each of the four contests and whose scores averaged 90 and under 93, a Bronze medal; 93 and under 96, a Silver medal; 96 and over, a Gold medal.

The Wisconsin buttermakers are to be commended for their enterprise in sending in their butter for the contests. We had in June seventy-eight entries, July eighty-two, September seventy-four, October one hundred eighteen. Wisconsin buttermakers were awarded fifty-seven medals: thirty Bronze, and twenty-seven Silver medals. And, of course, a Gold medal was awarded our ornamental display. As regards scores, compared with other states, Wisconsin was second on average scores in June and October, third in July and September. Minnesota was in the lead with more entries and higher average scores. There must be a reason for this and one our people should look into and if possible remedy. The question is, has Minnesota better natural advantages than Wisconsin? Are the men, who are engaged in the business, men of better intellect, or has the state of Minnesota done more to educate and help the buttermakers? In my opinion, Minnesota has no natural advantages over Wisconsin, neither do I believe their men engaged in manufacturing butter are any more intelligent, only as they have had more instruction. Minnesota has a force of twelve instructors, or inspectors, traveling the whole season among the creameries of the state, while Wisconsin has but one. Minnesota has

been doing for their buttermakers what Wisconsin has been doing for their cheesemakers. Results show that the money appropriated by Minnesota has been wisely expended. When the results of the July contest were announced, one of the Minnesota commissioners said to me: "That's worth a million dollars to Minnesota."

Before Wisconsin had a dairy school and before the Dairy-men's Association had sent out instructors, the buyer who bought a car-load of cheese found no uniformity. Most of the cheese had a bad appearance. Care was not taken in having the bandages smooth; some were mouldy; others with dirty finger marks, and scarcely a lot without some bad cheese, and none of them as good as are made at the present time. Inspection then was not as thorough as now. Since the dairy school has been started and the Dairymen's Association has been sending out instructors, the cheese are much more uniform, the factories and the cheese are much cleaner and the product much better.

Buyers, at the present time, would not consider cheese, made and cared for as they were twenty-five years ago, of much value.

A Wisconsin legislature never appropriated money more wisely than for the building of the dairy school and the sending out of dairy instructors.

Ex-Gov. Hoard, in his address at the Cheese Makers' convention, in Milwaukee, last month, took occasion, as he expressed it, "to scold" the cheesemakers a little for their lack of interest in exhibiting cheese at the Exposition. After what has been done by the state and what the state is still doing, I think Mr. Hoard would have been justified in scolding these cheesemakers harder than he did. I also think the farmers, the patrons of the cheese factories, deserve a scolding for not insisting on the factorymen sending their cheese for exhibition. They have been receiving a direct benefit for years from the appropriations made by the state and when the state wishes to show its products in competition with other states the cheesemakers and patrons of the factories should show some appreciation. The State Board of Managers did not ask the cheesemakers to give their cheese. The cheese that were sent were sold and each man received his pay for them. We have in this state about thirteen hundred American cheese factories. In June we had sixteen entries; July, thirty-one; September, thirty-nine American

cheese and eighteen Swiss, Limburger and Brick; October, thirty-three.

Wisconsin had sixteen by eight feet of space for American cheese. To keep this space full and make a creditable exhibit I was obliged to buy a number of cheese. There was only one cheesemaker in the state who exhibited at each of the four contests, P. H. Kasper, of Waupaca county, who was awarded a gold medal.

In justice to Mr. Kasper, I also want to say that he wrote me at the opening of the Exposition that he was willing and thought the cheesemakers of Wisconsin could well afford to send in the cheese necessary for such an exhibit in the interest of the great industry in which they are engaged.

The awards offered by the Exposition on cheese were the same as offered on butter. The state was awarded a gold medal on the ornamental display of cheese. In other states there was the same lack of interest by the cheesemakers.

There were more entries of cheese from Wisconsin than any other state or country and our scores were higher. Our average scores in June were 93.26; July, 95.7; September, 97.6; October, 97.12. Only five of our July cheese scored below 95; in September and October, only two each month. The cheese exhibited from Wisconsin in the last three contests were almost perfect and reflect great credit to the manufacturers and to the state.

DISCUSSION.

Ex-Gov. Hoard: I was not a little interested in hearing what Mr. Loomis had to say about Wisconsin's dairy cow, that was on exhibition at the World's Fair. I happened to be a member of the Board of Managers, looking after that matter. When we got the artist on the ground to make this cow, which we wanted to represent a Wisconsin dairy cow, there was a good deal of amusement. The artist put us up a cow that it would be pretty hard to see anything dairy-like about her, except her udder, and when he was expostulated with, he turned around,

and he says, "Why, you want me to destroy the entire artistic effect?" and we told him "artistic" was not the word, "dairy" was the word. We wanted a cow that should show in her lines, in her form and shape, that she was distinctively a dairy cow, and the artist had the beef ideal in his mind and he was putting us up a cow that was not a dairy cow at all, and I found it pretty hard work to convince him. I found thousands upon thousands of farmers in the state of Wisconsin who have the same ideal in mind; they are talking about one kind of cow and building another.

Secy. Burchard: Mr. President, in the interest of truth, I think I ought to add a little, or at least question some statements made by Mr. Goodrich in regard to the market value of Canadian and American cheese. I think if he will look at the market reports for the last two years, he will find that Wisconsin cheese has uniformly sold on the Wisconsin boards of trade at a higher price than Canadian cheese has brought in Montreal.

Mr. Goodrich: When I was there two or three years ago, I studied the market reports, and I found at that time Canadian cheese was quoted two cents upon the market, above American cheese.

Secy. Burchard: Well, three years ago is a good deal of a back number; and, more than that, Wisconsin cheese is not to be graded as American cheese, it is to be graded as Wisconsin cheese. Wisconsin cheese has sold, I won't say every week, but practically every week this year, for more money than Canadian cheese brought in the city of New York. How much of that was due to the efforts made by this Association in this and years past, in sending out its inspectors to go from factory to factory, it perhaps does not become me to say. Undoubtedly the cheese that were exhibited at St. Louis were selected cheese. They came from factories that had been visited by our inspectors from year to year, and that is one reason why the legislature of Wisconsin should not delay to increase the force of cheese and butter inspectors.

The Chairman: It was my privilege to visit a number of times this display of dairy products at St. Louis, and one other state had a cow modeled in butter, I think it was Missouri; one in particular was modeled after a particular Jersey cow that

they valued very highly in Missouri, and it was a fine object lesson to impress upon the people as they passed by, and interesting to listen to the comments that were made, "My, isn't she ugly?" "Her bones stick out," etc., rather than commenting upon her great capacity, her great muscle and really lifelike look as a profitable dairy cow.

JEFFERSON AND MARATHON COUNTIES—WARNINGS AND ENCOURAGEMENTS.

C. P. Goodrich, Fort Atkinson.

Mr. President, Ladies and Gentlemen: It sometimes is profitable to look over the life road we have traveled and see where we have made mistakes and where we have made successes. It is true that we cannot go back and travel that road over again, but we are able to warn others to avoid our mistakes and may be able to encourage them to follow our example when we have made a success.

I believe the great problem before every farmer is how to provide for his family and himself and make profit off from his farm and at the same time maintain its fertility. That can be done. It is done in many countries. Belgium, the most thickly populated country in Europe, has more productive land now than it had five hundred years ago, and it has well supported its population, but the people of the United States came here from the old country and they found a fertile soil; they commenced to rob the soil of its fertility and they kept on moving westward in their work. We want to avoid becoming soil robbers.

Wisconsin has done better than the states east of here. You heard what Governor Hoard said about Indiana and Ohio and I know what he said is true. I also know we do not want it to be true of Wisconsin.

I noticed Mr. Everett said that we did not own the land. I believe that is true; some of us old grizzly headed fellows will

strut around and talk about "My land, I own a great big tract of land," etc., but I want to tell you we don't own an acre of land. It is all God's earth, it is here to feed God's children on, and you and I have no more right to rob it of its fertility and leave it for the next generation to starve on than we have to break into a bank and take away the money that belongs to another. That is the way I look at it.

Now, I will read my paper.

Jefferson county is in the southern part of Wisconsin and was one of the first counties in which the business of tilling the soil was commenced. As early as 1840 the farmer began to put in his work, and in a very few years the county was nearly as thickly settled with farmers as at the present time. The land was rapidly cleared up and made ready for growing crops.

More than half of the county was originally timbered land; the balance "openings"—land where scattering timber grew—and wet prairies with no timber. The county contains 548 square miles. The soil, taken as a whole, was fairly good.

MARATHON COUNTY.

Marathon county is located in the geographical center of the state and was nearly all covered with a heavy growth of timber. It was one of the later settled counties of the state, very little farming having been done till about 1874. After that year the land was rapidly taken by farmers and cleared and fitted for growing crops. The soil, for the most part, is remarkably good, and especially adapted to the growth of all the cultivated grasses and other forage crops. It is the largest county in the state, containing 1,532 square miles; nearly three times as much as Jefferson county.

SOME CENSUS RETURNS.

In 1870 the population of Jefferson county was 34,040, and that of Marathon 5,885; about half being in the city of Wausau and the rest scattered around at the different lumber mills and nearly all engaged in lumbering, and practically none were farming. In 1900—the last U. S. census—there were in Jefferson county 34,789 inhabitants, an increase of only 749 in 30

years. Marathon county had 43,256 inhabitants, an increase during the same period of 37,371. Jefferson county had 3,453 dairy cows, or one to each man, woman and child in the county, and 2,055 cows besides. Marathon county had 15,519 dairy cows, or a trifle more than one to each three of its inhabitants. That year—1900—Jefferson county raised 27,536 tons of clover and timothy hay, and Marathon county raised of the same kinds of hay, though mostly timothy, 68,448 tons.

SOME FACTS IN THE HISTORY OF JEFFERSON COUNTY.

The early farmers of the county seemed to have the idea that all there was to farming was to plow up the ground, sow it to wheat and sometimes other grains; when the crop was ripe, harvest and thresh it and take it to market, and the next year do the same thing. Thus they went on year after year. They never seemed to think that with every load of grain sold off there went a part of the fertility of the farm, and if this process was kept up long enough, the fertility would be so reduced that no one could get a living from it. Occasionally, indeed, there was a man who could see that this was not the right way to farm, and stocked up his farm with cattle or sheep, and thereby averted the ruin toward which he was tending.

I have in mind a man for whom I worked when a boy. He knew he was not doing just the right way, for I heard him say once: "I know this isn't the right way to farm it; I suppose it will make the land poor after a while, but it will last as long as I live and I don't care a rap what becomes of it then. Let the next generation look out for themselves; I had to look out for myself." But he either lived longer than he calculated, or else the land got poor quicker than he expected, for when he died he left a run-down, impoverished farm which was covered, for all it was worth, with a mortgage that cost his sons, with the best methods of live stock farming, a long, hard struggle to lift.

But the most of the farmers kept on in the same old ruinous way; the crops of grain growing less and the partial, and sometimes total failures coming oftener. When the farmer had a failure of his wheat crop, and the debts he had incurred for expenses in running his farm, and his store and grocery bills, for

the year, became due, and which he had vainly hoped to pay from the proceeds of his crop "after harvest," then he had to put a mortgage on his farm, which mortgage could never be lifted by the old way of doing things.

A CHANGE TO DAIRYING WAS MADE.

As a general thing, farming went on in the way I have been describing till 1870. It is known that at that time more than half the value of the farm lands of Jefferson county were under mortgage, and their productiveness greatly reduced. Things could no longer go on in this way; something different had to be done. Farmers turned their attention to dairying. They were driven to it by force of circumstances. They had to do it, or quit and go west and find new fields to devastate. If their lands had been richer they would have held out longer, but this would only have delayed, for a few years, the final disaster. It is a fortunate circumstance that the farm lands of Jefferson county were more easily exhausted than are the lands of some parts of the country, because the farmers were sooner driven to better methods.

Since dairying has been adopted by almost every farmer, the fertility of the soil has been gradually restored, and on many farms made richer than it was in the state of nature, because what has been raised upon the farm has been fed to cows and the fertility in the feed put back on the land; and, besides, the fertility from the fields of Minnesota and Dakota, in the form of bran and oil-meal, has been bought by the car load and fed to cows to still further enrich the land.

And now the farmer is prosperous; his land will sell for four times what it would when dairying was commenced; the crops of grain and forage are very much larger, and the cow pays a big price for them. Most of the mortgages are lifted and the farmers have good houses and fine, commodious barns; besides having money in the bank. But the best thing of all is; on most farms the fertility has been fully restored so that when we are done with it, we will not leave to those who come after us a barren waste.

The 78 creameries and 8 cheese factories and 36,844 dairy cows in the little county of Jefferson having turned into the

pockets of her farmers about \$2,000,000 annually; why should they not be prosperous?

WARNING TO MARATHON COUNTY.

Now, don't think I am saying any of these things to boast; for I am not. I have told you of our sins, and have not tried to cover anything up; of our just and inevitable punishment; of our repentance and our redemption. The main object of this paper is to make emphatic a warning to all farmers who are tempted to do as we of Jefferson county did in early days. The warning is not needed by every Marathon county farmer, for you have cheese factories and creameries and there are many very fine dairy herds and prosperous dairymen. Still, I think there are many who need the warning, and if they do not heed it, will find themselves in the condition that the majority of Jefferson county farmers were in before 1870—impoverished, with heavy mortgages.

I find some things in the census returns which I have read to you that make me fear for some of you. I find that Marathon county, compared with Jefferson, had one-quarter more farms, one-quarter more inhabitants, only three-sevenths as many dairy cows, but raises $2\frac{1}{2}$ times as much tame hay, mostly timothy. Now, what are you doing with all that timothy hay? You surely are not feeding all that 68,448 tons of hay, besides all the other forage you raise, to 15,519 cows. Some of you are selling the hay off. The man who makes a business of raising and selling timothy hay off the farm instead of feeding it to stock is as surely on the road to ruin as the farmer who makes a business of raising and selling off wheat and burns the straw to get it out of the way, as thousands used to do in the early days of southern Wisconsin.

ENCOURAGEMENTS.

Marathon county is fitted by nature to be one of the best, if not *the* best agricultural county in Wisconsin. No other county has richer land or better water, or is better adapted to raising clover, that sheet anchor of the farmer, or will raise better peas, oats, barley, grass and all other forage plants which are needed

to make dairying successful, with the single exception, possibly, of corn. And even that does better as the forests are cleared off and the sun is let in to warm up the soil; and it will in time, when varieties of corn are planted which are suited to the climate and soil, perhaps, do as well as in most other parts of the state. The butter made here in the creameries is fully as good as that made in the more southern counties; and the cheese is conceded to be better.

Marathon county, with the present number of farms, ought to have 50,000 dairy cows; and, in time, when the farms are developed as they should be in a few years, 100,000 cows. When that condition arrives the farmers of Marathon county will be prosperous indeed.

DAIRYING LEADS TO PROSPERITY.

As one travels about the country in different states he can tell the dairy districts, as he passes through on the train, by the good houses and large barns and other evidences of thrift and prosperity. The commercial traveler will tell you that there he finds his best customers, who buy freely and pay promptly.

There is never a failure of dairy products. Those who depend on special crops have frequent years of failures, but there never was a season yet in Wisconsin when there was not feed enough for cows, of one kind or another, raised to provide fairly well for the year. The dairyman's income with a given herd of cows varies but little from year to year, and he can calculate with reasonable certainty about what it will be. He is not elated at times with the expectation of getting an immense crop and big prices and tempted to run in debt on the strength of it, and then have his crop a failure because of sudden blight or storm, or have the yield greatly reduced by drouth.

The dairymen's income comes steadily along each week, or each month, through the whole year; therefore, he gets into the habit of paying as he goes. When the farmer's income is from some crop that is sold off once a year, he gets into the habit of running into debt at stores. He gets what he wants and the members of his family get what they want, and it is charged

up to him. When the crop is sold and he gets the money, he goes to settle up with the merchant. He is astonished to find his account so large, and he does not have money enough to pay. He has got behind, and the chances are he will be still more behind the next year. After a while a mortgage has to be given to raise the money to pay up. This habit of getting into debt is a bad one, and dairymen are more likely to keep out of it than any other class of farmers.

DAIRYMEN HAVE MONEY IN BANKS.

That dairymen, as a class, have more money to their credit in banks I am sure, for I have made that a subject of special investigation. I found it so not only in Wisconsin, but in Iowa, Illinois and other states.

A few years ago I asked a banker at Fort Atkinson, my own home, if farmers deposited much money with him, and he said: "Yes; we have about \$100,000 that the farmers in this vicinity have left with us." I asked him what class of farmers left the most. I told him I wanted to know for a special purpose. He said he would look into it and tell me in a few days. When I met him again he said he was astonished that it was the dairymen that deposited most of the money. He said he could not understand it. He could not believe dairying was so much more profitable than other farming as that would indicate.

After talking it over for a while he finally arrived at this conclusion, which I think is correct: "The dairyman gets his monthly check and goes to the bank to get it cashed; he does not need all the money just then and he deposits some. He now has a bank account started, and he finds it is a nice thing. He likes it. He gets into the *habit* of having a bank account,—by the way a pretty good habit—and he will not draw it all out unless in case of emergency. Then it's a *fine* thing to have. The grain men who get their money once a year, don't do that way. They have a place for it and it don't get into the bank, unless it may be for a few days, sometimes.

Of course, I did not ask who the individuals were who had money on deposit. If I had, he would not have told me, for that would have been violating business rules and would not have been right. He simply told me that dairymen deposited

the most money. Bankers in other places have told me the same thing.

DISCUSSION.

Ex-Gov. Hoard: What special encouragement would you mention for Marathon county?

Mr. Goodrich: To keep 100,000 dairy cows where fifty of them are now, and stop selling off timothy hay. Now, I suppose some men will say, "Why, what is the other fellow that wants the timothy hay going to do?" You better look out for yourselves and let them look out for themselves. Let the Jefferson county fellow furnish the hay. But if a lot of cows are kept on a farm, you can raise surplus hay, and still keep up the soil by raising clover or alfalfa, and while you are doing that, you are getting a bigger income than if you raise forage and sell it all.

Ex-Gov. Hoard: Another thing; in Jefferson county the silo is a very important thing, and they raise forage in that way and save the use of so much hay.

Mr. Goodrich: Yes, that is right. All good dairymen down there have silos, and they have most of their cows freshen in the fall, and that is a great deal of help. They get the largest flow in the winter time when milk and butter are worth the most. Butter is worth 31 cents just now, and cows that were fresh last spring are dry now, and they are not producing any of that 31-cent butter. Another thing, if a cow is properly cared for and fed, she will produce more milk and more butter if she freshens in October than if she is fresh in April. I didn't use to believe that, but I know it is so, and it is reasonable, too, when you come to think about it. A cow that is fresh in the spring gives a good flow of milk if she has good grass and is in good condition and is a good cow, but that only lasts a little while; along in midsummer, in August, comes the heat and the drought and the flies, and she is bound to shrink in her milk, no matter how well you feed her. The flies will torment her, so that no feed will make up for the discomfort that she has. So she goes into the winter, giving very little milk. If

a cow is fresh in the fall and she is properly fed and cared for, particularly if you have a silo to give her succulent food through the winter, or if you can raise roots and do the same thing, you can keep up the flow of milk very well through the winter and when she comes out to grass in May and June, she is almost as good as a fresh cow, and then when the flies and the heat and the drought come, why, it is time for her to be dry anyway.

A Member: Would you advise a man to have Red Polls for a dairy cow?

Mr. Goodrich: I don't want to talk about breeds. I believe in the dairy cow. There are Red Polls that are magnificent dairy cows. There are Red Polls that cannot be dairy cows, because they are beef cows. There are Shorthorns that are splendid dairy cows, but the majority of them are not and it is just so with the Red Polls, "Old Mayflower" and "Mayflower II" of the Red Poll breeds were splendid dairy cows, but they had the dairy form; they were no more beef cows than the scrawniest Jersey you ever saw. If a man is going to make a business of dairying, of course he wants dairy animals, and of course it is wisest to take a breed that has been bred and used for the dairy, hundreds of generations. He is more sure to get good dairy animals.

A Member: Did you ever use the silo as a supplement to the pasture in a drought?

Mr. Goodrich: I never have on my farm. One of my sons feeds ensilage every day in the year, and the pasture was never so good but what his cows would greedily take hold of the ensilage when they came off the pasture. They would come up to the gate at four or five o'clock and bellow for ensilage. They didn't eat a great deal, not as much as they would in the winter, but it was a variety, and they like it.

The Member: That was my experience. I have fed it all summer and found that they like it. What size silo would you advise the average farmer to have on an eighty acre farm in Marathon county, having twelve or fourteen cows?

Mr. Goodrich: You ought to keep more cows. When you build a silo, you want to build one for twenty-five cows and make it 18 feet in diameter and 30 feet deep. One of my sons feeds ensilage the year around, and he keeps just as many

cattle as he has acres of land; he finds it just as good for his young stock. A silo of that size will hold something like 100 tons, or a little more, and if you only feed through the winter, you won't feed over four tons to a cow. If you try it, I am sure you will find it work so well that you will have more cows than twelve or fourteen.

A Member: Would you rather build two comparatively small silos than one large one?

Mr. Goodrich: Yes. The dimensions I mention make a comparatively small silo. If I had a hundred cows, I would not build any silo more than 18 or 20 feet in diameter, but would have more of them.

Mr. Riethrock: That means a round silo?

Mr. Goodrich: Yes. I suppose that has come to be understood by everybody talking about a silo, that the proper form is round.

Mr. Riethrock: What is the best approved material?

Mr. Goodrich: There are a great many different ways to build silos. It depends on the cost of the material a great deal. They are building a lot of silos with cement and grout. The first I saw of that kind was in Canada, and then in Michigan, and now they are building them here and they work all right if you have a foundation so that they will not settle. I saw one a few days ago where the ensilage is spoiling, because the foundation has settled and cracked. The first cement silo I saw was built with a wall 18 inches thick and that made a pretty expensive job, because it takes a good deal of cement; then I saw them made thinner and finally they are now making them with a wall only six inches thick. They put in a row of barbed wire right around it, which acts as a hoop, so that there is no danger of its bursting out, and they bed that wire in cement. It is put in with layers of about a foot and with each layer they bed the wire right in.

A Member: Would you recommend a hollow cement wall, made of blocks, with a dead air space between?

Mr. Meyers: I think I could recommend that. The frost would not strike through in cold weather. There is a thing I have observed, that is a good thing. I observe that where the farmers have gone into dairying, it puts the community on a

cash basis. They can pay up their small bills as they go along, rather than run accounts.

A Member: I should think that with the advantages Marathon county has for rock, that we could build our silos just as cheaply out of rock, and more so than if we used cement.

Mr. Goodrich: That may be so if you have rock. If you want to get boulders out of the way, of course it don't cost you anything, and of course that will make a permanent silo, which is a good thing. There were some stone silos built about Oconomowoc in 1880. The walls are two feet thick and I suppose some of them are just as good today as they were when they were first built.

Mr. Meyers: We built some stone silos down in our country and they have been good silos, but we have found that the frost would strike through that stone wall. I think concave blocks would be a good deal better, and then if you build of stone you have to cement it inside of the wall.

Mr. Goodrich: It used to be supposed that freezing ensilage would spoil it, but it is a well established fact that it does not. I have seen it frozen onto the wall of a silo five or six inches thick or more, when it was very cold weather, such as we have had lately. They let that stick on and then when it thawed, it would loosen and come down and it would be all right, only it must then be fed quickly. It must be thawed before feeding, of course, it would not be right to feed it cold.

Mr. Wright: Our farmers can produce plenty of milk, but they are producing it all in the summer time when it is worth about fifty cents a hundred, and they are not getting any of this 30-cent butter. It is going to take some time before they have silos, but I find a good many of them are feeding chopped straw, and they do not really have good luck in making lots of milk in the winter time out of that. What can you recommend for a food ration for the production of milk until we get more silos? Shall we leave the oats in the straw?

Mr. Goodrich: Or cut the oats early for hay; but best of all is clover, and I know you can raise clover all right. Raise clover to feed your cows in the winter; try some alfalfa and see if they do not do well on that. I am sure they will and with alfalfa and clover, if you have cut them properly, you can keep

your cows giving milk well in the winter, although, of course, it will be better when you get a silo.

A Member: If you haven't a silo, wouldn't it be a good investment to buy some bran and oil meal to feed with the clover?

Mr. Goodrich: Yes, that is all right; clover and bran make a well balanced ration, only it lacks the variety that we ought to have.

A Member: Do you think there is much benefit in cutting up good clover or timothy hay? Some people recommend cutting all the coarse food fed to cattle.

Mr. Goodrich: I don't know that there is much good in cutting only where you feed some heavy grain feed like corn meal. If you were feeding corn meal and alfalfa hay it would make a well balanced ration. Alfalfa has 11 per cent of digestible protein. If the alfalfa is cut and moistened and the corn meal put on it, I think that is better than to feed them separately. You don't need to cut all your alfalfa, but a little would lighten up the corn meal.

A Member: Suppose you feed bran, middlings, corn meal and oil cake to your cattle as grain, then feed timothy and clover hay mixed, would you recommend cutting that hay?

Mr. Goodrich: I hardly think it would pay.

Mr. Rietbrock: In adding to clover hay oil cake, corn meal and bran, you add the protein element and it makes the feed all right, but do you add the succulence, I mean the juicy stuff that imitates the grass? You want something juicy and there are two ways of getting that, either through rutabagas or silage.

Mr. Goodrich: The question refers to the feed before they get the silo. If you haven't got a silo, do as well as you can without it.

Mr. Rietbrock: You can get a silo quicker than you can get alfalfa. You could get your silo a year quicker.

Mr. Goodrich: You don't look at it just right. Here is a man hesitating about building a silo; it is going to cost him something and he hasn't the money in his pocket, so he wants to put it off and he asks what he shall do in the meantime. I say feed clover and alfalfa and raise some roots if your pocket will stand it.

Mr. Rietbrock: But bran and oil meal and alfalfa don't make juicy food. It is juice they are after with the silo, consequently you don't answer the question. I say if you can not get a silo, then raise a root crop, rutabagas or something else, some kind of turnip or a beet. But now it strikes me, Mr. Goodrich, that there should be no great difficulty about getting that silo. A silo is not as expensive as people think it is, and there is no experiment about it, the silo has absolutely passed beyond the experimental age; it is a fixed fact that the silo is a grand, good thing. I speak from experience.

The Chairman: Is there any difficulty in raising corn up here?

Mr. Rietbrock: Absolutely no difficulty in raising corn for the silo. There is sometimes difficulty in ripening the corn, but it matures in fine shape for silage, and it yields a very good quantity per acre. I would say in regard to the silo, if you want to build it of something more permanent than wood, I think I would prefer grout, because you must build your silo with something, and if you laid your wall in stone, it would take just as much cement as though you lay it in small stones, gravel, and that is what makes grout. Grout is made of sand, gravel and cement, and if you make good grout you will use no more cement than you will ordinarily in making a stone wall. Our creek beds are full of the right kind of gravel; the Wisconsin river has lots of it; the Red river has lots of it, all the creeks have it, and there is no difficulty in finding excellent gravel for grout. In making grout you use sand and gravel up to the size of a hen's egg, and you use it in the proportion of one part cement to ten parts of sand and gravel, and that will be quite as cheap as to lay up a stone wall and will make you a very much better wall. But if you do it, make the sides, of the wall thin with an air space in between, and that makes a good silo.

Ex-Gov. Hoard: I want to answer the question of the gentleman over here in regard to the use of summer silos. In 1901, we had a most disastrous drought that swept over this state, almost killing the grain crop, and it was bad on the man who had a lot of grain sowed for selling. A hot wave swept up from Kansas and scalded everything down. The cows in the

Fort Atkinson creamery commenced to shrink at once in their yield. Before we were through with it, in three weeks' time, those cows had shrunk from 40 to 50 per cent, and that never came back, and they never will come back. The man that practices summer dairying ought to remember that; that a cow never will come back if she shrinks once. Now, where is he? He has got a lot of poor cows, such as I saw out here in Marathon county the other day, poor, beefy cows, no more fit to be in a dairy than a jackass is. Then he goes to work and he has those cows come in in the spring and along comes a drought and he is cut down.

Now, I want to tell you what I did. I had fifty tons of old silage left over in my silo. The minute my cows commenced to shrink, I opened that silo and gave them fifteen pounds in the morning and fifteen at night, and the cows held right straight up through that drought. Now, what was that worth? Thirty pounds a day at the rate of \$2.50 a ton, and that was in my silo. I learned my lesson then, and the next spring I put up a summer silo and I have two now; I would no more be without that to assist me in the summer's drought than nothing under the sun. I don't know what ails all the farmers that they will stand and higgie-haggle about building a silo. The first silo built in the west was a little place dug into the bank in the town of Koshkonong by Levi P. Gilbert, way back in 1878.

Mr. Goodrich: 1877.

Ex-Gov. Hoard: Never mind. Now mind, my friends, there are farmers in that town today you cannot get to build a silo. One old German said to me one day when I said, "Chris, why don't you build a silo? You have been dairying all these years, why don't you build a silo? Is it because you are a German?" "Gott in Himmel," he says, "no." I said "Every German farmer in the town of Lake Mills has got a silo, you are the only one I think in the town that hasn't a silo. What is the matter with you?" He says, "Oh, I think a silo is humbug. I thought a silo was humbug when I commenced, and I think a silo is humbug today, and I guess I think all the time humbug." The old man had simply got the habit, and you can't move it at all, but, my friends, there is more money in

dairying with a silo than there is with any other adjunct about the farm.

A Member: Can you build part of the silo one year and the rest the next year?

Ex-Gov. Hoard: Why, no. You could no more build the silo half way than you could marry a wife half way.

A Member: I know a fellow that has built a little each year.

Ex-Gov. Hoard: But as far as you do build, you must build it perfect.

The Member: Oh, yes; he put it up about ten feet the first year.

Ex-Gov. Hoard: But it doesn't cost much. You build a barn today in Marathon county and it will cost you from \$7 to \$10 a ton for storage capacity for your hay, to build. You can build a silo for \$1.50 a ton storage capacity.

Mr. Rietbrock: In other words, a silo to hold 100 tons would cost about \$150, and that ought not to scare any reasonable man.

Mr. Everett: There is another point in reference to building by degrees. You ought to build it complete the first year and be done with it, because the deeper the silo the more it will hold and the better the silage.

The Chairman: I know of a man who built a silo, and put up the stone work and roofed is over with a temporary roof. He put into it practically every dollar he could raise, but it was a good deal better than to go without having any. It has worked all right.

Mr. Meyers: Have you had any experience in putting alfalfa into the silo?

Ex-Gov. Hoard: I have seen it done, but I have never done it myself, and I don't see any good in doing it. I want the alfalfa in the form of hay, because I have got the succulent food in the corn silage and I want this variety. I grow about thirty to forty acres of alfalfa. I had less last year, and I have been suffering for it all winter long, and I hope to have forty acres this year, if it comes through the winter all right, and I guess it will. You can grow alfalfa in Marathon county to beat the band if you have a mind to take hold and try it.

Mr. Quaw: What is the relative value between clover and alfalfa for feeding?

Ex-Gov. Hoard: It can be very well measured by the chemical analysis. This chart on the platform shows that there is 11 per cent of protein (which is the element that makes milk, largely, and muscle, and all those elements which are the most valuable) in alfalfa. You buy bran to get protein; you buy oil meal to get protein; you buy gluten meal to get the protein, all these foods that we buy down in the southern part of the state. Now, clover contains 6.8 digestible protein, alfalfa is 11 per cent; bran is 12.6. Alfalfa is within two points of being as rich as bran. When the farmer is growing alfalfa, practically he is growing so many tons of bran, particularly with the second and third crops; the first crop is a little coarser. You old German farmers call it Lucerne. It is considered a very fine hay in Germany. That is the difference between alfalfa and clover. But now see, how much clover is worth more than timothy. I talked the other day with a lot of farmers and they had a great deal to say about timothy. Why, we no more think of feeding timothy hay down in Jefferson county than we would of feeding marsh hay; we don't raise it. Timothy is only 2.8 per cent, three pounds in the hundred, and yet when I talked to these old farmers out here at Eden, I couldn't get into those men's heads that timothy was poor hay for the cow. You can sell timothy for so much, sure enough, and many short-sighted men do sell it and think they are getting their money back, but every pound of clover is worth two pounds of timothy to make milk, and then you have got as much more in the alfalfa as 11 is bigger than 6.8. Now, I want to say another word about alfalfa. How many of you could take timothy hay and keep a lot of brood sows, say from the last of November till next spring on timothy hay? Could you do it? Yet, for every year for several years, I have kept all my brood sows on nothing but alfalfa hay, and I would like to see a man raise a finer lot of pigs than mine. An old Irishman came in and looked at them, and he said, "For the love of God, they ate it like bastes." There are a lot of brood sows there producing these little bodies, they have a beautiful lot of pigs and they are cool and comfortable and milk like cows. I fatten seventy-five out of seventy-eight I raise. Before that time I was troubled all the time with my pigs, I would be feeding them corn, and it was all wrong. The alfalfa shifted them over en-

tirely, not one spoonful of corn did I give those sows. They got their drink, a little skim milk left after the calves were fed. They are in good flesh, they are just as fat as they ought to be, and when the pigs come they are bright and strong and healthy and vigorous, and they go right ahead. My friends, you have not thought out this alfalfa question, and I want to say to you that Marathon county can produce alfalfa magnificently. Your ground is covered here with a fine snow every winter, and one of the best things in the world to save alfalfa is to have soft snow on it. You want to begin to think it over.

Mr. Everett: I have just one word to add to what the governor has said. The idea is brought forward here, clover or alfalfa. Why wouldn't you say clover and alfalfa? Alfalfa is not a crop for rotation. Clover is all right for the common farmer.

Mr. Brumalty: I tried alfalfa and wasn't very successful with it. I sowed it with winter wheat in the spring.

Ex-Gov. Hoard: Oh, well, that is the reason. It cost me \$60 to learn your lesson. I sowed it in the spring and went over it with the harrow three times, laid logs on the harrow. I sowed \$60 worth of seed, and I never got a spear. You can grow clover that way; but try an acre of alfalfa. Get half a bushel of alfalfa and try a good piece of ground that is well drained, say one acre. Sow nothing but alfalfa, plow the ground. Remember, you cannot make it catch as you do clover. I can go onto your fields in the spring and sow clover and it will catch nicely, but you cannot do that with alfalfa. It must have the ground prepared just as finely as you would prepare it for wheat or barley or oats. Just try one acre, get into the habit, study it for five or six years; it is something that you need to study a good while before you know how to handle it.

Mr. Rietbrock: Will you explain about the varieties of alfalfa as between the common and the Turkestan?

Ex-Gov. Hoard: I have got both and I can't tell the difference.

Mr. Goodrich: Nor I either.

Ex-Gov. Hoard: The Turkestan is there yet and the other is right by the side of it, and I don't know which is which, and which is tother, but this much I would say, get good alfalfa seed. You are liable to be imposed upon, so I wouldn't advise you to

sow a whole lot anyway, but sow one acre and study it. It is a ticklish plant; it is a jealous plant; you want to study it, but when you have got it, you have got the finest hay that any man ever saw on earth, for every thing. Why, think of it, my friends, today there are two big mills in Ohio and Kansas City grinding alfalfa and selling it at \$15 a ton for poultry meal all over the United States.

Question: Do you harrow this alfalfa after you put it in?

Ex-Gov. Hoard: Oh, certainly; get the land very fine, work your land nicely, sow on thirty pounds, then harrow it once or twice and let it go.

Question: How about cutting it in the fall?

Ex-Gov. Hoard: I wouldn't cut it the first year; I would let the weeds and the alfalfa grow and let it all alone. That is my practice; other men talk differently.

Mr. Goodrich: There is one thing it would be well to mention in talking about alfalfa. It won't do on all kinds of ground. Land that is too low, so that the permanent water line is within three or four feet of the surface will not do for alfalfa, because the roots have to go down.

Ex-Gov. Hoard: I have dug down twelve feet, twelve is the deepest I went down with the alfalfa three and four years old. I saw an alfalfa root suspended from a cupola in Denver that they said was 100 years old, and those roots were thirty-four feet long. I don't know but what we will have to establish an alfalfa communication with China. But it makes a wonderful growth. Mr. Everett said you would have to use clover for rotation. Just to give you an idea, I will tell you, I sowed last spring eight acres of clover with a peck and a half of barley as a nurse crop and I sowed twenty-two acres of alfalfa with a bushel and a half of barley as a nurse crop. I took off the barley and let the clover and the alfalfa go. Two-thirds of the clover died after I took off the barley, and all of the alfalfa lived. It is more hardy with me down there than clover, more certain, more sure, but with you here, you have no difficulty in growing clover, have you?

A Member: It grows here like weeds.

Ex-Gov. Hoard: All over this country, and yet when I rode down to Eden the other day, there was three times as much timothy grown as clover. Now, why?

Mr. Everett: It is a more marketable crop.

A Member: I think timothy is raised because it is bought largely for feeding horses; a good many people like timothy better than they do clover for feeding horses. For my part, I would rather have half the amount of clover than good clean timothy hay.

Mr. Jones: It is best to cut down the weeds the first year?

Ex-Gov. Hoard: You cut the weeds down to kill them, don't you? Now, just as much as you hurt the weeds you hurt the alfalfa, and your great point is to get that young, tender alfalfa plant to have just as much growth at the top as possible in order that it may make a corresponding growth at the root, and if you cut off this young alfalfa you are liable to kill the plant. John Widman left a strip right along where he did not cut it off, and that strip today is very much superior to the rest that was cut off. Let the weeds grow the first summer and next year there won't be a weed there, you will cut the alfalfa three times and that will kill all the weeds. In the first place you want to sow it thick enough, half a bushel to the acre, and that will help keep the weeds down; then let it alone. Put it in in the spring of the year, in March, on a slope, if you can, so that the water runs off readily, and does not form little ice caps. Put it on as rich land as you can, and sow a bushel or a bushel and a peck of barley with it, if you choose, and then when you cut the barley, cut it high. Then let the alfalfa alone, and it will come on and make a good growth. Then the snow will come on and your alfalfa will have roots down in proportion as it has top above. If you cut it off two or three times, it certainly will injure this root crop.

Mr. Everett: How about pasturing it?

Ex-Gov. Hoard: Never pasture it; never turn a hoof onto alfalfa. Men talk to me about pasturing alfalfa all the time. Let me tell you what I did. I took a hundred and fifty tons of alfalfa worth \$10 a ton off of thirty-two acres. Now, would you pasture a piece of ground that was earning that amount of money? I have had pieces of alfalfa that have grown me in three cuttings a little over six tons to the acre. Now, that would sell ordinarily in the Fort Atkinson market at \$10 a ton, and that is \$60 an acre, and yet men will talk to me about pasturing. Why, that kind of men would turn milk bottomsides

up and skim the underside. The trouble in putting cattle or horses onto this alfalfa is this, the crown is very tender, it sprouts above the surface of the ground. Those sprouts come out of the dirt on those crowns and any weight badly injures them. If you draw a wagon load of hay after the first cutting over your alfalfa field, you can see the tracks of those wheels in the second cutting showing exactly the impression of the wheels on those crowns. Therefore, never let a hoof of any kind on your alfalfa.

Mr. Howard: How do you cure alfalfa?

Ex-Gov. Hoard: That is a very important question. I cure alfalfa hay and I cure clover hay in the cock with hay caps. Now, I scare some of my farmer friends half to death! Why, we always cured hay in the windrow. But, you know, alfalfa, if you cure it out in the windrow in the sun, you lose half the leaves and that is the richest part of it. Now, I go and get forty-inch wide Pepperil A sheeting, tear off forty inches. That makes an ordinary hay cap. I tie a ten-inch string to each corner. I tie a half of a horse shoe to each corner, and there is your hay cap. Load them onto a stoneboat and draw them out into the field, after the hay is cocked up, and it is cocked up just as quickly as it will handle. It is cocked up and a hay cap thrown right over the top. The first erop will come about the first of June, and you are pretty sure of showers about that time. That hay cap will shed every bit of rain off from that alfalfa, and it won't hurt your hay at all. It costs you 12 cents a piece for those caps and they will last me, hung up in my shed and taken care of, five or six years, and in one season they will pay for themselves twice over in the quality of the hay. You look down my field and you would think there was an army of soldiers camping there, that thousand hay caps. Then every forty-eight hours two men go along with forks, stick them into the hay cock and pull it to themselves off the old ground. They go very rapidly, pulling it along, and after about two or three days the hay cock is opened up for a few hours on a fair day. It has gone through the first sweat and that is the dangerous sweat; no hay ever enters into combustion or gets on fire after it has had the first sweat. You give it that first sweat in the filed, then as soon as you open it and give it about an hour or two of air, you load it onto your wagon while it is still

quite daily and you save every plant to be raised and your hay and packed away. It will come up then to the second sweat and then your hay will come out so that it is very green. These hay caps are worth everything in alfalfa that wants to cure clover or alfalfa. We treat clover in the same way exactly. I want to say that almost every small every farmer in the country, cuts clover to sell. Do you know why clover kills? Largely because you kill it. Clover is a perennial and the minute the seed forms in that clover that is the end of that root it has got to die. Now, if you want to keep your clover, cut it just before the seed forms and then Nature in the effort to produce seed will send it from the ground a long string, second crop. Cut that in the same way and she will send up the third crop. Now, then, if you let your clover blossom and the heads get brown then they are full of seed and you have killed your clover. I cut my clover just as quick as it commences to blossom, no matter whether the weather is wet or dry, because with the hay cap I can handle it. With out the hay cap I can do nothing with it. With alfalfa, just as soon as you see the little blue tines come when it is not probably one-fiftieth in blossom, it goes the clover, and then a strong crop follows. Your cutting the second crop is always in proportion to cutting the first crop early, and so with the third crop. If you let the crop stand too long, you get a weak crop following.

The Chairman: I am sure we have all been profited by this alfalfa discussion. If you want to realize how much, go home and try it; that is what I did last year and I have as a result six acres of alfalfa that went into the winter in good shape.

Secy. Burdick: The question of feeding has come up here. I happen to have in my pocket a little from that I wanted to show personally to one man that I expect to see here. This is the amount of food that were fed to the famous prize-winning cow "Loretta D." during the St. Louis dairy cow demonstration, and it is instructive in many ways. Of course, that cow was fed more than we ordinarily feed dairy cows, but the selection of feed is the important thing. That cow was fed 120 days; 114 days she had alfalfa hay; the average amount was 19.4 pounds a day. She was fed on alfalfa mixed with a grain feed, 117 days, and the average was 6.38. She was fed clover hay four days, simply to splice in when they did not have al-

falfa, I suppose. She was fed corn silage 120 days, the average amount was 12.15 pounds. She was fed a little corn meal 111 days, out of the 120. She was fed bran 120 days; ground oats 48 days; rolled oats 25 days; oil meal 119 days, and the average per day was 1.82, not a very heavy feed. Cotton seed meal, 55 days; gluten feed, 117 days; 3 other foods less than a hundred days. That shows what that man who had that cow and the others in charge, thought were the best things to feed for getting the largest and the most profitable production. All these were given a special money value.

Mr. Goodrich: Have you got the figures there how much she produced?

Secy. Burchard: Yes. In the 120 days she produced 5,802.7 pounds of milk. The daily average was 48.35. The amount of fat produced, pure butter fat, was 280.16 pounds. The average per day 2.33. The estimated butter product was 333.03, an average of 2.75 pounds daily for the 120 days. That was the return for the amount and kind of foods that I have read to you.

Mr. Goodrich: She produced \$82 worth of butter at 25 cents a pound. The cost of all of the food was \$32 and some cents, which I haven't exactly, but it left a clean profit of \$50 in 120 days, feeding the cow as she was fed.

Secy. Burchard: I want to say a word or two in reply to what Mr. Rietbrock has said about juicy feed, silage or roots. I believe it is a good thing for every farmer to have these things, but if he doesn't have them, either from lack of attention or laziness or want of conviction, during the winter months when he is feeding dry forage it will pay him to feed at least one pound of linseed oil meal daily, and that, in a large degree, helps, the same as the juicy feeds spoken of here.

Mr. Quaw: I am afraid that what has been said about alfalfa may lead our farmers astray. Our soil in the spring is quite springy, wet, even up on the sides of the hills, and I do not believe that land would do for alfalfa. We are troubled a good deal with that in our country, that our land does not drain out quickly in the spring.

Ex-Gov. Hoard: Your land is heavy clay, is it not?

Mr. Quaw: It is clay and loam together.

Ex-Gov. Hoard: My land is very heavy clay and I am de-

layed about working it in the spring, because I cannot get onto it.

Mr. Quaw: Well, we have here, in a good deal of our land, springy places, even on the side hill, you cannot put a team on it early, and that lasts quite a long time. Now, I would like to know whether it will pay to try to put alfalfa on land of that kind.

Ex-Gov. Hoard: Does that last so long that you cannot work the land and sow it to grain?

Mr. Quaw: There are some places that I have to wait, but probably all farms are not afflicted as badly as I am in that way. I have a good many of those springy places on the side of the hills.

Ex-Gov. Hoard: Do you find it down on the level?

Mr. Quaw: No.

Ex-Gov. Hoard: Well, put it there then.

Mr. Quaw: Wouldn't it be better to go up on higher land where there are no low places?

Ex-Gov. Hoard: Put it up there.

Mr. Quaw: But isn't it absolutely necessary to have land that is well drained?

Ex-Gov. Hoard: On general principles, yes; but go and try it where you think it won't grow and satisfy yourself whether it will or not. You know seeing is believing.

Mr. Quaw: I have seen some friends that tried it and made a failure of it.

Ex-Gov. Hoard: People made a failure of it in this state for thirty years, but we are now commencing to make a success of it. For thirty years men have been saying, "You will never grow alfalfa." When I started, even Dean Henry said, "Hoard, I am afraid you will never succeed with it." But now it is growing all over Jefferson county, and Professor Henry himself is a believer in it. You see we didn't know what to do, we were working in the dark, but every farmer that started in to grow it himself and stick to it, has learned about its nature, about what to do with it, and that man is no longer a fool on the question. In Jefferson county, there is five hundred times more alfalfa than there was ten years ago, yes, a thousand times.

Mr. Robinson: How is this alfalfa adapted to our sandy land?

Ex-Gov. Hoard: We have got sandy land south of Fort Atkinson on which alfalfa is doing very finely. We have very sandy hills and it is doing well. Over toward Palmyra they have very sandy land and they gave it a heavy dressing of barnyard manure, and succeeded in starting alfalfa and it is doing very nicely. I believe alfalfa will grow in a thousand places where at first you and I would say it would not grow, but there is just one place that I would bar, and that is where if you dig down for a well you strike water at three or four feet from the surface. That won't do.

Adjourned till 8 o'clock P. M.

Convention met at 8 o'clock P. M.

President Hill in the chair.

The exercises of the evening consisted of vocal and instrumental music and addresses by Mrs. Adda F. Howie and ex-Gov. Hoard. The latter was so rich in interesting reminiscences that it is inserted here in full.

WHAT A THIRD OF A CENTURY HAS WROUGHT.

Thirty-three years ago the present month, the senior editor of Hoard's *Dairyman* issued on his own responsibility, a call for the formation of the Wisconsin Dairymen's Association. At that time there were possibly twenty small cheese factories in the state. Dairy knowledge of any and all kinds was at the very lowest ebb. Such a thing as a Holstein or Guernsey cow had never been seen in the state. A very few Ayrshires and Jerseys had been introduced, but, not one in five hundred of our farmers would know that they were Ayrshires or Jerseys if they saw them.

The farmers of Wisconsin were given up to the raising of wheat and it had brought them to severe poverty, as well as destruction of the fertility of the soil. The period of high prices for farm products on account of the Civil War had passed.

The agriculture of the state and the hope and pluck of her

farmers were in a slump. Farmers were selling out their farms for what they could get, prices ranging from \$15.00 to \$25.00 an acre in the oldest sections of the state, and moving to Iowa, Minnesota and other western states in great numbers. They had no other idea of farming than the same ~~same~~ wasteful method they had practiced in Wisconsin.

The call for the formation of a State Dairymen's Association was responded to by seven men, four of whom are living at this writing. It is difficult to express in words how little was known of the true meaning of dairy farming at that time. A cow was a cow and that was about all that anybody knew concerning her. There was no idea of breeding cows especially for dairy purpose. We doubt if there were five hundred men in the entire United States who had such ideas and were trying to work them out. The state of New York, Western Reserve in Ohio, a portion of Vermont and New England were known as the cheese-producing sections of the country. The factory system had been introduced less than ten years previous. No one had heard of a Canadian cheese or cheese factory at that time, although a start had been commenced in the Dominion by a Mr. Farington, a relative of the Faville Bros. of Lake Mills, Wis., who were pioneers in the industry in this state at that time.

Such were the feeble beginnings of this now mighty industry in Wisconsin which has since spread over the entire nation, with wonderful developments in Denmark, Germany, Sweden, Russia, Australia, New Zealand, and even in Argentine. It is more difficult to describe what it is now than what it was not thirty-three years ago. A great intellectual impulse has been imparted to dairying in all its branches and details. To this and this alone is due the remarkable advance in understanding and accomplishment which has been wrought. Agricultural chemistry has poured a flood of light upon this question. Out from this source has come the Babcock milk test; the Wisconsin curd test, and all we know concerning milk constituents, feeds and feeding, the application and office of fertilizers, and the reconstruction of our soils.

It must be remembered that our farm lands from the Atlantic to the Mississippi river have been subjected to the fearful strain of ignorance and wasteful tillage ever since the American farmer commenced his march westward. His path has been

marked by destruction of forests and fertility at every step of his way. The American farmer in the main has despised science, because he was ignorant of science and what she had to contribute for his welfare. His class has had the poorest educational facilities of any other class in American society, unless it be the slums of the cities. The main chance he has had for education and culture for two hundred years has been the country district school with its poor buildings, poorly educated and poorly paid teachers, no library, no apparatus, and the bare opportunity of four months in the year of such education at that.

Do you consider that 95 per cent of the farmers of this country as they stand today never had any other chance for education than the country district school? What did that school ever do for them in the way of teaching them anything about their own business? Has it ever said a word to them about the way they were destroying the fertility of their farms? No! Has it ever taught them a word concerning the meaning of the scientific terms that are used in the current literature of the farm? No! Can you expect that men will want to read such literature, even if it be ever so valuable when they cannot understand it? Would the lawyer or the doctor or the engineer, or the editor be the men they are today if they had not been trained to understand the language that is used in the books and papers that are devoted to their profession?

Thousands of farmers, earnest seekers after light and knowledge, have written to Hoard's Dairyman asking for an explanation of the meaning of the terms in agricultural chemistry that we were obliged to use in discussing feeding problems. So great did this demand become that we were obliged to place at the head of our column of Inquiries and Answers, a short glossary explaining the meaning of those terms.

Do you not see that the country district school was to blame for all this lamentable darkness of understanding? Had it been the school it ought to have been; had the farmers of this country realized the tremendous necessity for a better quality of farm intelligence than they possessed; had the teachers of the land realized it; had the law makers realized it; had we all realized that without this valuable knowledge the soil must suffer in fertility; the state must decline in prosperity and agriculture languish just as it did in 1870,—I say had this country

school problem been understood as it should have been, do you think New York would have lost over fifteen hundred millions of dollars in the decline in value of her farm lands in 30 years? No! Would the same bad results have been seen in the fine old farming lands of Ohio and Indiana, and Illinois? All that stopped this wave of disaster in Wisconsin, caused by the ignorance of the farmer concerning that which his own country school should have taught him, was the coming of the cow.

Do you not see that what we need is more light, not more land; more understanding of the elementary foundations of agricultural science among the farmers, a better system of country district schools, where the farm boy, the farmer who is to be, may acquire a knowledge of such elementary knowledge just as he does a knowledge of elementary arithmetic, grammar, geography or physiology? The country school must of necessity be elementary. Does not the state owe to the farmers the chance that the elements taught there shall be of as great assistance as possible to them in after life as a farmer? Should you not as farmers begin to exercise your own influence in behalf of such a system of country education? Should not every merchant, every banker, every lawyer, every preacher, every editor, raise his voice in favor of such a consummation? Should we not all as patriotic citizens help build a body of conviction and sentiment which shall make the country district school what it deserves to be, a bulwark and living force for the enlightenment of the sons and daughters of the farm, for the sake of a safer, a better and more profitable order of farming, a higher order of farm citizenship.

I said to you that what saved Wisconsin from this wave of destruction in farm fertility and land values was the coming of the cow. How did she compel a new order of thought and practice?

In this way: Associated dairying, co-operation of farmers in factories and creameries became necessary in order that the product of the cow might be made the most profitable. This was the beginning of farm co-operation. Farmers had never learned how to co-operate. It was a tough job in many instances then, has been since, and is yet. The farmer that co-operates with his neighbor must be of a more intelligent order of intellect. It is a sign of good brains, good understanding,

good heart, and good citizenship to be able to work together to a common purpose. That is the meaning of the word "Civilization." It is the antithesis of barbarism.

The Wisconsin Dairymen's Association meant co-operative thinking, planning and discussion of means to ends. That means education. From out this Association came a host of beneficent agencies, all working to a common end and purpose. It was this Association that first started the Farm Institutes, the Dairy School at Madison, the Dairy Boards of Trade. It worked out to a favorable result the reduction of freight rates on butter and cheese to the seaboard from the maximum of 2½ cents a pound on cheese, in common cars in 1874, to the present rate of less than 75 cents per 100 lbs. in refrigerator cars.

It has poured forth a flood of thought and discussion upon the minds of Wisconsin farmers in its thirty-three years of existence. The best and most practical dairymen, scientists, bacteriologists, chemists, and breeders of dairy cattle have poured into its conventions the richest and most valuable results of their life and thought. All this to make the Wisconsin farmer an intelligent man in the conduct of his business. Wonderfully has the state responded in the material growth of herds of cows, cheese factories and creameries. In like manner have we kept pace in the quality of our product, as witness the awards of merit which we have won, beginning with the World's Fair in Philadelphia in 1876, when we won over all the world on cheese, followed by the Great International Dairy Fair in New York in 1878-9, when a Wisconsin girl won over all the world on butter. From that time on, Wisconsin has been to the front at the World's Fairs in New Orleans in 1864, at Chicago in 1893, at Buffalo in 1901 and at St. Louis in 1904.

Today, in marvelous contrast with the situation which your speaker confronted thirty-three years ago, we now have one of the greatest and foremost dairy states in the world. The cow is at once the pioneer in the transition from lumbering to farming, and the final finisher of agricultural faith in the oldest counties of the state.

Our progress is limited only by one factor, that of the growth of dairy intelligence among the farmers. In proportion as they remain ignorant and unenlightened as to the true meaning of

dairy farming, is our advancement slow and halting. Just as fast as they recognize the need of more and better knowledge do we go ahead. Our main hope for the future must lie in the boys of the farm. We want them to bring wealth and renown to Wisconsin as the producers of the finest breeds of dairy cattle and other domestic animals in all the land. We want them to become broad minded, well trained, highly intelligent dairy farmers, producing the finest butter and cheese in America, selling skill and brains, not ignorant muscle. We want them to comprehend the real foundation of this great industry, how that the factory and creamery are not first in any sense, but, rather the farmer, the cow and the farm. Here at the farm end must be the inspiring thought, brain and purpose that shall make all the rest we hope for possible, and, without which, we can have no hope of progress.

All that we have gained in this wonderful transformation of a third of a century, has been wrought out by making the mind of the individual farmer intelligent on dairy questions. The whole procession must wait for him, and there is no help for it. Is there not great significance then for the future of our greatness as a dairy state, in my plea that the country district school shall be made what it ought to be in giving to our farm youth something that shall equip them better than their fathers were equipped for the problems that lie before him. Our farm boys are bright and brainy. Give them a right start and they will finish the race for themselves by modern aids to intelligence. Let every farmer remember one thing: the way to become a strong, influential citizen is first to become a progressive, masterful farmer. There and only there is the seal royal to his standing as a man among men.

Adjourned till 10 o'clock A. M., next day.

MORNING SESSION, THURSDAY, FEBRUARY 9, 1905.

Convention met pursuant to adjournment at 10 A. M.

President Hill in the chair.

THE

The chair appointed the following committees:

Resolutions: C. P. Goodrich, W. J. Gillett and E. C. Jacobs.

Nominations: H. C. Taylor, P. J. Drissen, Mrs. Adda F. Howie.

Finance: F. H. Scribner, Wm. Erbach, U. S. Baer.

Exhibits: E. H. Farrington, T. Corneliuson, Prof. R. B. Johns.

THE FARM SEPARATOR CREAMERY SYSTEM.

T. Corneliuson, Belleville.

Mr. Chairman, Ladies and Gentlemen: The invention of the cream separator gave great impetus to the development of dairying, and what are now generally known as "whole milk creameries" were established throughout the country.

Many of those creameries, however, soon met with great problems and difficulties. In more sparsely settled localities and localities in which dairying was followed as a side issue only, it was found necessary to cover too large a territory in order to get enough milk to operate the creamery profitably, necessitating long hauls to the creamery with the milk daily thus making the transportation too expensive. Another serious drawback was the poor condition of the milk when it reached the factory, being frequently sour or tainted, owing to the long distance hauled, and by the time the skim milk was returned to the farm it was frequently worse than useless. This led to the establishing of skim stations and it was thought this scheme would solve the problem. However, that system was soon found too

expensive, also, and when at about this time the hand or farm separator appeared on the scene it met with great favor, and soon displaced most of the skimming stations, and in many instances the creameries themselves either wholly or in part changed to the farm separator system, so that today over a large part of the state scarcely a creamery can be found that does not handle more or less of farm separator cream.

A system which can gain such a foothold, in less than a decade of time, must evidently have merit, yet, I have not found a single buttermaker who contended that "The Farm Separator Creamery System" as it is now conducted resulted in improvement of the quality of the butter. On the contrary, practically all agree it is retrogressing as far as the quality of the butter is concerned; and I am fully convinced that this system, as it is now generally conducted, constitutes a grave menace to the good name of Wisconsin as a butter producing state.

Some of those creameries are operated with total disregard of all that has heretofore been considered good dairy and creamery methods, allowing their patrons to disregard cleanliness and care in the handling of the product, accepting anything that is offered in the form of cream.

We have been taught that the ripening of the cream is the most important step in the entire process of butter making, that cream ripening required skill, training and painstaking care on the part of the operator, and suitable apparatus for controlling the process, yet, this most important work is now transferred from the creamery to the farm, during a large part of the year at least, by practically all farm or hand separator creameries.

If Wisconsin expects to retain its position as a leading butter producing state, this very important work of cream ripening must again be restored to the buttermaker, and that will mean that the cream must be delivered to the factory in a sweet, pure and wholesome condition, as it is simply idle to talk about ripening cream which has already been ripe for several days, and during all this time been kept at a temperature favorable for bacterial growth.

There is no good reason why just as good butter should not be made from farm or hand separator cream as from any other. In fact, some of the best butter that it has ever been my privilege to see or taste was made from farm separator cream. But,

to accomplish this, it is necessary that cleanliness and intelligent care in handling the products, while yet upon the farm as well as in the factory, be conscientiously observed at all times.

It has been suggested that the cream be delivered to the factory every day, and wherever that is possible this is recommended, but in many localities that would not be practicable, as it would entail almost as great transportation expenses as the whole milk system. It seems more feasible to give the cream such care as will enable us to keep it sweet and wholesome for two or three days, according to season. This is entirely possible.

Cream which has been kept two days, even though it is sweet, will lack the quality peculiar to fresh cream, but this is easily overcome by pasteurization and the use of a first class commercial starter. But no amount of pasteurization or any other process yet known will enable us to make first class butter out of old, tainted and overripe cream, in which gaseous and perhaps putrefactive fermentations have been allowed to go on for days and perhaps a week, although such cream may be considerably improved by pasteurizing it.

Every dairy farmer who uses a farm separator should provide a suitable milkhouse or dairyroom where the separator and other dairy utensils as well as the cream may be kept and cared for. Such a house or room need not be expensive, although it should be substantially built and in such place and manner as will enable one to keep it, as well as its surroundings, in a clean, pure and sanitary condition.

The custom of placing the separator in the barn or cow stable should never be tolerated.

A liberal supply of ice should also be provided in order to be able to control the temperature of the cream at all times.

Immediately after milking, the milk should be removed from the barn and separated and the cream cooled to 50° F. or below and held at that temperature till delivered to the creamery. Warm and cold cream should never be mixed. In winter precautions should be taken to prevent the cream from freezing.

No creamery can expect first class cream simply for the asking, but if first class butter is worth more money than second or third class, then first class cream is certainly also worth more

than the poor and inferior grades from which only poor butter can be made, and should be paid for accordingly.

Every farmer delivering first class cream should object just as vigorously to being classed with the careless and slovenly as he would if his test for butter fat were lowered several per cent just to even up with those having cream less rich in butter fat than his own. And it is to be hoped that the farm separator creameries in Wisconsin will all in the near future establish the principle of paying for the cream not alone according to the Babcock test but also according to the acidity or titration test, supplemented by good judgment at the receiving stand.

DISCUSSION.

Mr. Scribner: Do you think it is possible to deliver cream to the creamery twice a week and have it safe, a good product?

Mr. Corneliuson: I think that depends largely on the way it is taken care of. If you take proper care of it, I think it is possible to deliver twice a week in the winter, but not in the summer.

Mr. Scribner: What do you call proper care?

Mr. Corneliuson: Such care as will keep it sweet and it ought not to be kept any longer than you can keep it sweet.

Mr. Scribner: I can keep cream sweet a week. Do you think that would make first class butter?

Mr. Corneliuson: You can't do that unless you pretty nearly freeze it, can you?

Mr. Scribner: Yes; I can do it by cooling it down and keeping it in ice water, still I think it might develop some flavors, although it might be sweet, and these flavors might affect the butter.

Mr. Corneliuson: Certainly it would not make first class butter unless you pasteurized it. I believe with pasteurization it is possible to keep cream three days in the winter time and make first class butter, but not otherwise.

The President: As a neighbor of Mr. Scribner, I know how he keeps his cream, and I am sure I tell the truth when I say that Mr. Scribner's Friday night's cream is sometimes

eaten on Milwaukee breakfast tables on the next Wednesday morning, and it is perfectly sweet.

Mr. Corneliuson: You couldn't expect that kind of care at the average farm.

The Chairman: Of course Mr. Scribner's cow stable is ideal.

Mr. Chambers: Is Mr. Scribner's separator in the barn?

The Chairman: Yes, it is in the cow stable.

Mr. Rietbrock: Now, right on that line, I think we should have more light. I know about ten establishments that we may consider as ranking first class in the state of Wisconsin. Some of the very best dairymen in the state have their separator in the barn. I don't consider myself much of a dairyman, but I have a separator and I have it in the barn, too, and I do it, because so many of my acquaintances who are first class in their business have their separators in the barn. This morning we are told by Mr. Corneliuson that that is to be condemned if we are to maintain the reputation of Wisconsin products. I think we might as well settle the question once for all whether it ought to be there or whether it ought not.

Mr. Everett: You are supposed to be old enough to know better than to follow the examples of young fellows. You ought to be setting examples.

Mr. Rietbrock: I don't know. The more I learn the more I know that I don't know much, and I find also that the knowing men are at variance with their ideas of what is just right. I think I do know what Governor Hoard would say about this. I think he would say that you should have such conditions in your barn that you can have it there; that it is your business to keep your barn at all times sweet and clean; it is your business to have your barn ventilated so that the cow, when she is making her milk, will produce a good article. I think that is what he would say, because it is not only when you take the milk away from the cow and put it into the separator, that that milk may become contaminated, but during all the time that the cow is feeding and making the milk, getting herself in condition to deliver it out of her udder, she is bringing it in connection with the air through breathing processes.

Mr. Jones: It would simplify the matter to find out what we mean when we are speaking of a separator. The frame

work of my separator sets in the barn the year around, but no part that comes in contact with the milk. The can and the bowl and all the apparatus that comes in contact with the milk is taken out of the separator immediately after the milk is skimmed, taken away from the barn and kept away until it is to be used again for skimming. We have endeavored to make the highest priced butter for several years, and I think that my wise brethren are doing just as we do, leaving their framework in the barn.

Mr. Corneliuson: We are told that in Holland the barns are kept so clean that the kitchen and household utensils are kept right there, and I think where a barn is kept so clean that you would be willing to have your dishes there, there would be no objection to having the separator in the barn; but the fact of the matter is that the majority of barns are not so built or ventilated, nor are they clean, and the separator standing there from one milking to another is subjected to contamination, dust and barn odors which will necessarily contaminate the milk.

Mr. Rietbrock: Do I understand Mr. Corneliuson to say that you do not condemn the practice of leaving the separator in the barn, that is, all the utensils connected with the separator?

Mr. Corneliuson: Yes, lots of them do that.

Mr. Rietbrock: That is a thing that I think every clean man will condemn, but the frame work is left in very many good barns and where people make a first class product. Of course there is a good strong distinction to be drawn there.

Mr. Corneliuson: When they take away the separator bowl, that of course does away with considerable objection. Nevertheless, when you separate in there, unless the air in the barn is clean, the cream will be more or less contaminated.

Mr. Everett: Isn't it possible for the average dairyman to partition off nicely and tidily a separator room in his barn, in which the work of separating may be done in a cleanly manner?

Mr. Corneliuson: Yes, that could be very easily managed in most places.

Mr. Jacobs: In cold weather, however, you are going to lose the warmth of the barn, and it is quite a serious proposition to run a separator unless you have some kind of heat, either artificial or from the cow stable. It seems to me the right proposi-

tion is to make the barn so that it is a suitable place. Now, in regard to this question of contamination. I have found some separators that were contaminating the barn, instead of the barn contaminating the separator. The handling of the farm separator needs a great deal of attention. I do not think there is any other tool or any other process that is more abused in this state than the farm separator.

The Chairman: I have visited within a week, and you all know it has been very cold, a barn where the floor was frozen with filth an inch or two thick, while the separator itself was in first class condition, excepting the man said he had trouble to run it when it was cold. Another barn I was in, the separator did certainly contaminate the barn, it was filthy. Milk was spilled on the floor and oil from the frame of the separator, the whole business was simply filthy. What Mr. Corneliuson says about keeping dishes in the cow stable, while it may sound a little too idealistic, at the same time is getting very near the truth. Unfortunately, we cannot talk a great deal about such barns as Mr. Rietbrock and Mr. Scribner describe, but must talk about the average farmer's barn and try to induce the average farmers to keep their barns in a different condition than that they do now. Mr. Corneliuson, what would you consider an ideal cow stable?

Mr. Corneliuson: Well, I should consider an ideal barn one that is built so that it can be conveniently kept clean and the air renewed about once every hour, every two hours at least.

Mr. Scribner: It does not necessarily need to be an expensive barn.

Mr. Corneliuson: No, I do not think there is a great deal more expense attached to building a barn properly than building it improperly. It is simply a question of a little forethought and time.

Mr. Jacobs: Won't you name a few of the essential points of a good barn, easily cleaned?

Mr. Corneliuson: It should have a good floor, one that the liquids from the manure will not leak through and get in under the floor. A good cement floor, I think, is about as good a floor as you can get. Then it should have a proper system of ventilation. I think the King system of ventilation is consid-

ered by all practical men to be about as good as there is. Of course there should be plenty of light, plenty of windows.

The Chairman: The fact remains that almost everybody when they come to build a barn, if they put two windows on each side and one on each end,—and the upper side, if it is a basement barn, doesn't have any in it,—they think they are doing all right, and that it would cost more to put more windows in. If they would stop to figure out, they would find out that windows do not cost any more than double boarding.

Mr. Goodrich: There is one point in favor of the farm separator that has not been mentioned here, and that is that the skim milk can be fed while it is new and warm and sweet to the calves and the pigs, and it is very much better than the skim milk that is returned from the creamery. I think the extra value of the skim milk will more than pay for the extra work of skimming the milk on the farm.

The Chairman: The extra work of skimming the milk on the farm is not as much work as to hitch up and go to the creamery.

Mr. Goodrich: The cream has to be taken to the creamery just the same, whether it is with the milk or not, but of course it is a great deal less, only about one-eighth, so that when we skim it on the farm, the cream gatherer can take eight times as much, and of course that reduces the cost of transportation. I believe it is possible to make just as good butter from farm separators as can possibly be made where the whole milk is delivered, if the proper care is used, but where the whole milk is delivered, the patron is sometimes more particular, because he knows that the buttermaker cannot use sour milk. Unfortunately, he knows another thing, and that is that the buttermaker can make butter out of sour cream, and so he doesn't take even the same pains. The idea of grading the cream is all right, but who is going to grade it? Can you get cream haulers that are good enough judges and are honest enough to be trusted to grade it? It certainly ought to be graded, because you see when the gatherer takes twenty pounds of cream from Mr. A and fifteen from Mr. B and forty from Mr. C and the cream of one of them is poor stuff and they are all put in together, that poor cream contaminates the whole lot. It is very hard, indeed, as I know, to get a cream gatherer that knows

enough or will exercise enough judgment to grade cream. They worked on that plan at the West Salem creamery for several years; they had two vats, one containing the first quality and the other they called the "stink" vat, where they put the poor cream. This cream was churned and marketed separately from each vat, and that from the poor vat was sold for what it would bring. Of course nobody wanted to get into the "stink" vat; they felt it was a disgrace, besides being a losing proposition. That worked very well for a while, but I understand they have had friction there now. I don't know what is the matter, but I mistrust it was owing greatly to the fact that they could not get cream gatherers that would use good judgment enough. Can you suggest anything on that line, Mr. Corneliuson?

Mr. Corneliuson: I know of factories in this state that have this plan, that each patron sends the cream that he delivers in his own cans, and wherever that is done the buttermaker or one of his helpers, samples the cream, and while he is taking the sample for that test, it is easy at the same time to take a sample for the acid test and also examine it in other ways. But where they have to rely on the hauler to do this work, of course it would necessitate that he understand the work and will perform it properly, and I can readily see that that would be a very difficult arrangement to make.

Mr. Emery: This Association has, from its beginning, stood for dairy progress; it has stood for high ideals in this whole field of dairy work; and it occurred to me, when Mr. Corneliuson spoke of the necessity of the barn being kept in as clean a condition as any other place where human food is prepared, that is probably the right ideal for all dairymen to have and the ideal that this Association ought to promulgate. Milk and cream are, par excellence, human foods, and the stable is the place where it is manufactured, and if we can get this as our ideal, although it may at present be in advance of our practice, it is a good thing to remember that is a place where human food is being prepared, and that, therefore, the necessities of the case are such that the barn should be kept just as clean and the air just as wholesome as any other place where human foods are prepared. I believe that is an ideal we should strive to attain just as fast as it is possible for us to attain it.

Prof. Farrington: I believe Mr. Goodrich has struck the right note in speaking of the difficulty of procuring proper cream haulers, who are intelligent enough and honest enough to inspect cream. If that were possible, you could have three cans on the cream hauler's wagon, each can containing cream of a different grade, though of course, you would have to depend even then on the cream hauler's judgment as to which can each patron's cream should go into. But this other system that Mr. Corneliuson has mentioned is something, it seems to me, more practical. We have talked and thought about it a good deal at the dairy school, have compared notes and it would seem that the best way for putting our preaching into practice is for the cream hauler to have on his wagon a box large enough to hold a sufficient number of pint cream bottles, so that he will have one for each patron, and as he goes to each patron's farm he takes perhaps half a pint of that cream and puts it into this bottle, which is labeled with either the patron's name or number. Then that bottle is protected in the summer and in the winter from being too warm or too cold, so that the cream will arrive at the factory in about the same condition that he received it at the farm. Then some one at the factory who is interested in the quality of the product will have a chance to inspect the cream of each patron in practically the condition it left the farm. It seems to me that is a practical way of grading cream. Of course that pint of cream is not mixed with the other until the man at the factory has had a chance to inspect it, and by inspecting it he can find out about the average condition of the cream at the different farms and he can instruct his hauler as to which class he puts each particular patron into.

The Chairman: He can grade his patrons all right.

Mr. Jones: I have in mind another point in favor of the hand separator on the farm, and it cost me something to find it out. The papers tell us the number of hogs that are sent into the stock yards in Chicago at the present time that are afflicted with tuberculosis is something like 14,000 per annum, as compared with 4,000 a few years ago. If the patrons of a creamery send their whole milk to the creamery, they get the skim milk back, such as it is, to feed to their hogs, and he is likely to get milk from tuberculous stock and feed it to his calves, which are perfectly free from tuberculosis, whereas, if

he knows his own stock is free from the disease and feeds his milk at home, in a wholesome, warm condition, he will have the best results and without importing into his herd, upon which he has spent years of hard labor and thought and money, a disease that may be very disastrous and run all through his herd. I would not have my milk skimmed anywhere else than on my own farm and feed my own milk to my own calves. I don't want to take the chances of importing anything of that kind onto my place.

Mr. Goodrich: I don't want to drop this question of grading cream. It is not practical to have the cream hauler grade it—set that down. Now, is it practical to do it in the way that Mr. Corneliuson suggests? I have known one cream hauler to take the cream from fifty patrons. That would necessitate fifty cans. Is that practical? Sometimes the patron will have only two or three cows and others fifteen, others twenty. Is it practical? Now, as to Prof. Farrington's method. That seems all right, so far as telling the quality of the cream, but by the time he finds out what the quality is, the main body of it has gone into product and it does not help it for that day. Now, I cannot see any other way to do it than to have an army of inspectors that go to the farm the same as they do in Canada, and see that things are kept up in the right manner to produce good cream. That has been my idea for some years. Prof. Emery knows that I have talked with him about it, and I know that he is enthusiastic over it and we are going to have it if we go to the front, or even get up to where Minnesota is, or a little beyond, and that is the only way we can do it, have a lot of inspectors. It will cost something, and I hope the legislature will have the sense to make an appropriation of \$40,000 or \$50,000.

Mr. Scribner: I like Prof. Farrington's way because it makes this an educational matter. Here there is something to bring right home to the farmer. He can see for himself the trouble his cream is causing the buttermaker, and he will begin to look around to find out what is the matter. Perhaps he has left something standing in the barn, which has stable odors; perhaps he has not a clean place to store his cream; at any rate, he is on the lookout, and I like that plan.

Mr. Wright: We have gathered cream here, and we get it in

small lots, from three to fifty pounds, according to the season, and it is all done by the gathered cream system. When we started in, we gathered in individual cans, and we soon found out that there were three or four particular farmers that sent us sour cream every day, while others, we could always depend on having it good. Then we changed our plan, and commenced gathering cream all in one can, and let the gatherer sample it. We gave him two kinds of cans and the cream of certain farmers was put in a separate can. After you have been in business a few weeks, you find out who your dirty farmers are and who your clean ones are. We had competition here, there was another company and a good many of the farmers that wouldn't send to us. So we offered them twenty-two cents a pound for butter fat. At that time, butter fat was down to fifteen and sixteen cents. I think that all cream that is gathered in that way should be graded, for good sweet cream there should be a higher price than the other.

Mr. Emery: Having found cases where dirty or poor cream was offered, in your practice did those men get the same pay as the men who furnished good, sweet cream?

Mr. Jones: No, they did not.

Mr. Emery: That is one of the hard problems in the whole cream business. We have so many creameries and so many cheese factories in this state, and the competition is so strong that the creameries and cheese factories are receiving unsuitable milk, and the people furnishing it are receiving just as much pay for that unclean and unsuitable milk or cream as the man who is offering good, wholesome cream and milk, and that of course is discouraging to the man who furnishes wholesome, clean milk. The problem seems to be a great one, but our dairy industry in this state is a great one, and we must address ourselves in some way to this problem, and it would seem to me that these creamery men and these cheese factory men must be made responsible in some way for the quality of the cream and the milk that they receive; they must feel that they are committing a wrong upon the public when they receive it and manufacture it into human food products. Not only must they feel that, but the strong arm of the law must be laid upon them, as well as upon the patron from whom they receive the unclean milk and manufacture into human food that which is unfit for

human food. The great public has a right to have the food that is placed upon its table clean and wholesome. In every other department of the food business, the man who offers unclean or unwholesome food to the public is held responsible. The backbone of these factory men must be stiffened and I see no such efficient way of doing it as by the strong arm of the law. Now, it is said, and truthfully, that if one man rejects this milk, the patron takes it over to the neighboring factory and it is received there. That is altogether too true. But if we can have a large enough force of inspectors to be located in the different parts of the state so that they may go to a factory and inspect the milk coming in and there find that a large proportion is coming in in a wholesome and clean condition, but that a few of them will stand upon their so-called rights and furnish unwholesome milk—that those men can be restrained; that inspector can say to them “that milk is unlawful milk that is not suitable to be received into this factory to be manufactured into human food.” Then if that patron says, “If you don’t want to receive it at this factory, I will take it somewhere else,” he will be met by this proposition of the law, “If you take that milk to any factory, you will be prosecuted.” We need inspectors enough to do that work all over the state, and by an inspector I mean a man who is thoroughly skilled in the creamery or the cheese factory business. He must be a man who understands the business throughout. If he is inspecting cheese factories, he must know the entire process of making cheese and the best methods of making it, all about the technical work, all about every piece of machinery in a factory, and its necessity for being in a state of perfect cleanliness. He needs to know everything connected with the skillful and cleanly making of the best class of cheese; or, if he is inspecting a creamery, the same must be true in regard to the creamery business. He needs to know what milk is; he needs to know all the details from the standpoint of dairy farming; he needs to know what should be the conditions of the barns and the proper feeding and care of the stock; and then, when this milk is received and he has inspected it in the morning and finds it defective, he needs to be a man with spunk enough to say, “This milk is defective,” and able to bring a demonstration of it home to the producer. Why, with our inspectors, few as they are, only

four in the whole state, with 3,000 creameries and cheese factories in the state, 6,000 or more places where human food is dispensed in groceries, 2,000 meat markets, where all sorts of mixtures abound unfit for human food, with 900 drug stores where adulterated drugs are being dispensed, to say nothing about places where adulterated liquors are sold, yet this state of Wisconsin has laid this duty upon a commission and in 1889 it gave that commissioner an assistant commissioner, and a chemist, and under the general law of the state the superintendent of public property could put into that office a stenographer and a clerk. Aside from that, until 1903, only one person was added to that commission, while every other department has grown and expanded. It has seemed as though the state of Wisconsin had put a strong rope upon that commission and held it down so that it could not expand to meet the demands of these great industries. The influence of the dairymen in this state has not been heard for the expansion of this work as it has been in other states and in other lines of industry.

These inspectors, of whom I have been speaking, should be men who can go onto the farm and instruct those people how to care for the milk so that a suitable product for human food can be submitted, and if after proper instruction they neglect or refuse to comply, then the strong arm of the law should be laid upon them and the right of the public to have clean and wholesome milk should be preserved through the law. I wish I could show you some of the results of that work of inspection by these few inspectors that we have had going out in this work. Here is a sample, which I show you, of pure and undefiled dung that is being put into this human food, and this is only a single sample of many. I say that the dairy thought and the dairy interest of this state should make itself felt at this session of the legislature that there may be provided a strong and large addition to this force of inspectors or instructors to uplift this great dairy industry, in the interest, not only of the dairyman, but in the interest of the consumers of dairy products.

Prof. Farrington: I am very heartily in favor of everything that Mr. Emery has said in regard to inspectors. There is no doubt whatever but what they would be a great deal of benefit to the dairy interests of the state, and I want to suggest to the farmers and the creamery men that are here one way in

which they can also help themselves. There are 167,000 farmers in this state and something over a million of cows. Now, every factory, either creamery or cheese factory, that receives milk from 100 farmers can well afford to have one man who is an inspector of the farms sending milk to that factory, and if you have a creamery or cheese factory, you hire a man to operate that factory and you expect to pay him something, and you can quite as well afford to hire another man to devote all his time to going around amongst the farmers, helping them in every way, and improving the quality of the milk and cream sent from these farms. That is one employe that every factory ought to have.

FOLLOW YE THE FOOTSTEPS OF THE COW.

Prof. C. L. Beach, Connecticut.

(In introducing Mr. Beach the President said: Prof. Beach is the son of his father, Charles R. Beach, who was the loved and revered president of this Association years ago, and we are therefore more than glad to welcome him, not only on his own account, but on account of the pleasant memory in which we hold his father.)

Prof. Beach: Mr. President, Ladies and Gentlemen: Your chairman has told but half the story, because I also had a noble mother.

In his political economy Walker says, "A people privileged to live on a virgin soil, cultivating only the choicest fields and cropping these through a succession of years without returning anything to the land, can live in plenty if not fare sumptuously every day." But there comes a time, longer or shorter according to the system of robbery pursued, when the returns from the land are insufficient and new land is taken up and the process repeated. The march of our so-called civilization from Plymouth Rock, New Amsterdam and Roanoke to the Rocky mountains has been characterized as "land butchery."

We are all familiar with the agriculture of the south. Year

after year the cotton planter has harvested his crop, sold the lint and left the seed to *rot* about the gin mill. Later, when the value of the seed as a stock food was discovered, thousands of tons were sent to the north, and as much more in the form of cotton seed cake to England and Europe. Slowly year by year the fertility of the soil was removed and the land became exhausted. Then new areas were broken up and the process repeated: The historian recounts the loss to this section of our country by reason of the civil war, and the freeing of the slaves; but I venture the assertion that the south has sustained a greater loss by reason of a most ruinous system of agriculture.

The wheat section of the northwest has moved steadily westward from Wisconsin to Minnesota, from Minnesota to the Dakotas, and from the Dakotas to the Red River valley. During this time the wheat plant gathered to itself the nitrogen, phosphoric acid and potash of the soil, and the land became exhausted. For many years, the offal of the flour mills, containing the larger amounts of fertility, was allowed to waste at the tail of the race. Later, these by-products were used as a stock food, and the droppings of the animals returned to the land. As a result, the dairymen of southern Wisconsin recouped themselves at the expense of the Minnesota wheat farmer. A generation later, the Minnesota dairyman restored his depleted fields at the expense of Dakota, and today the whole northwest is drawing upon the fertility of the Red River valley in the form of nitrogen, phosphoric acid, and potash contained in bran and shorts. But it should not be forgotten that this robbing of Peter to pay Paul, while legal and legitimate, is still land piracy.

The ravages of the New England farmer upon the soil are proverbial and of long standing. The results are to be seen on every hand. There are many farms for sale today at less than the original cost of the buildings. Many holdings have been given up, and in the township in which I live, eighty are classed as abandoned farms. Time was when the New England land owner was prosperous, as indicated by the number and size of farm buildings. But the temptation was too great even for the shrewd Yankee, and the wealth of the New England soil has gone to feed the population of the city. Today the land is

neglected because exhausted. The young men and women of the farm are employed in the adjacent mill. It is not unusual to find the head of a rural family driving several miles a day to work in a factory, and engaged nights and Sundays in skinning the farm. And, mind you, this decadency in agriculture has taken place in a section which has enjoyed the benefits of the best markets in the world. There are some who claim that this transference of the brain and the brawn, of the vigor and the virility from the farm to the factory was inevitable. These observers would have you believe that New England would never have been taken up even for a goat pasture if the Pilgrim fathers had landed at the Golden Gate instead of at Plymouth Rock. But I do not believe it. I have seen what was once a part of an abandoned farm in Connecticut brought back to such a state of fertility that a single crop from four measured acres filled a 120-ton silo. Professor Henry visited us last summer and remarked that he had seen no corn in Wisconsin equal to that upon our Connecticut college farm.

I dwell upon the decadence of the New England agriculture for there is a phase of it to which I would invite your attention. Fall River, Massachusetts, has \$25,000,000 invested in cotton mills, employing 30,000 hands. In July, 1903, the mill owners announced a cut in wages which was accepted by the employes. A year later another cut of 12½ per cent was posted, but the workmen refused to accept it and walked out. The strike has recently been settled, but the employes have lost in wages a greater sum than the reduction for which they are contending would amount to in four years. For seven months the mill owners contended on the one hand that they could not pay in wages as much as formerly and the employes insisted that they could not accept less. In an article on this strike in *The Outlook* for December 17, Mr. Edward Porritt makes this significant utterance, "My feeling is if a southern dollar is all the Fall River industry can afford to pay its help, the industry had better go where a dollar goes as far as it does in the south in rent and in other requisites of family life." "It is an axiom upon the art of war that an army moves upon its belly, which is a figurative way of stating that obvious truth, that deprived of food men cannot fight." Likewise it should be axiomatic that our army of laboring men cannot long accept a declining wage

in a community where the cost of the necessities of life are constantly increasing. It is worthy of consideration, therefore, whether the decadence of New England agriculture is not a forerunner and contributing cause to a decline in manufactories. With these illustrations in mind, it seems to me that one of the most important questions that confront the farmer today is the preservation of the fertility of the soil.

The amount of the principal elements of fertility removed from the soil in products sold from the farm and the amount returned in the manure will depend upon the system of agriculture practiced on the one hand, and on the other to the methods of handling the droppings of the animals. The difference in the balance in income and outgo of any two systems may seem small and insignificant in any one year. But the differences in the sum of the balances for a period measuring the active life of an owner, say 20 years, are startling enough to command attention. I wish to call your attention to the advantages of dairying as a means of preserving and acquiring soil fertility.

1. FERTILITY REMOVED IN PRODUCTS OF FARM.

When the products of the farm are sold in the form of hay, potatoes, corn or barley, the larger amounts of fertilizing ingredients are disposed of also, but when the sales are in the form of animal products, then relatively smaller amounts of fertility are removed from the farm. The following table shows the amount and value of fertility passing off from a farm in different products for a period of twenty years:

TABLE I.—*Manurial value of products of farm of 80 acres for 1 year and 20 years.*

	Yield per acre, lbs.	Pounds per ton.			Value one year.	Value in twenty years.
		Nitr.-gen	Phos. acid.	Potash.		
Meadow Hay.....	2,000	20	8.2	26.4	\$408 00	\$8,160 00
Potatoes.....	7,500	7	3.2	11.4	561 00	11,220 00
Wheat	800	11.8	2.4	10.2	.....	.....
	1,200	37.5	15.8	10.6	455 00	9,094 00
Corn	1,680	33.0	11.8	7.4	454 00	9,072 00
Beef.....	160	53.2	37.2	3.4	75.39	1,507 00
Milk	1,562	10.2	3.4	3.0	130 62	2,612 00
Butter	62.5	2.3	1.38	.46	1 16	23 00

The above table shows that 80 acres in hay, yielding one ton per acre, would remove in one year fertility value to the amount of \$408. If it was possible to sustain this yield for a period of twenty years the fertility value in the crop would amount to \$8,160.00, or a sum equal to the worth of the land at a valuation of \$100.00 per acre. In a similar manner potatoes, yielding at the rate of 125 bushels, would remove in one year \$561 of fertility and in 20 years \$11,220. Wheat yielding 20 bushels of grain and 800 pounds of straw would remove \$455 of fertility in one year, and in 20 years \$9,094. Corn yielding 30 bushels per acre, would remove in one year \$454 of fertility and in 20 years \$9,072. If the four crops were grown in rotation and for equal periods \$469.50 of fertility would have been removed on the average in one year and \$9,390 in 20 years.

If the farm had been devoted to beef production, and the assumption be made that the 80 acres would support 35 animals from six months of age until sold as feeders one year later and making a gain of one pound each day, then the amount of fertility passing off each year would amount to \$75.39, and in 20 years to \$1,507.

If the 80 acres would support 25 cows yielding 5,000 pounds of milk each and the product were sold from the farm as milk,

then the amount of fertility passing off each year would amount to \$130.62, and in 20 years to \$2,612.

If butter was produced at the rate of 200 pounds per cow, the fertility passing off would amount to \$1.16 in one year and \$23.00 in 20 years.

2. DAIRY FARM MAY ACQUIRE FERTILITY.

With the hay, potato or grain farm, the fertility account shows only an outgo and that a large one. With a dairy farm on the contrary the fertility account shows a comparatively small outgo when milk is sold and an insignificant amount when butter is made and the skim milk retained. In addition the dairy farm may gain in fertility by exchange of home grown feeds for more nitrogenous ones, or by the purchase of a part or all the concentrates.

In Table 2 is shown the estimated fertility value of manure per cow, and the gain in fertility to the farm when all the concentrates (except corn in ensilage) are purchased. It is not to be supposed, even under the best conditions, that all the fertility in the droppings of animals will be saved and find its way to the land. It is commonly estimated, however, that two-thirds or three-fourths of the fertility of the food will appear in the manure and may reach the field.

TABLE 2.—*Storrs College herd—Fertility account calculated from feed.*

Per cow per year.						Gain in fertility to farm in 20 years with 25 cows.	
Feed consumed. Lbs.	Fertility in.			Balance of fertility to farm.		When milk is sold.	When butter is sold.
	Feed.	5,500 lbs. milk.	326 lbs. butter.	When milk is sold.	When butter is sold.		
1,754 hay.....	\$11.38						
8,700 silage.....							
2,030 grain.....	16.14	\$5.74	\$0.08	\$10.40	\$16.06	\$5,200.00	\$8,031.00

The above account is calculated on the basis of food consumed. During the past five years our herd has consumed per cow, 1,754 pounds of hay and 8,700 pounds of silage, all of which was produced upon the farm and containing \$11.38 worth of fertility. Each cow consumed 2,030 pounds of purchased grain containing \$16.14 of fertility. The average production of milk per cow per year was 5,500 pounds containing \$5.74 of fertility. The average butter production 326 pounds containing \$.08 of fertility. The balance of fertility to the farm per cow per year when milk was sold was \$10.40 and when butter was sold \$16.06. The balance of fertility to the farm at the same rate for a period of 20 years and for a herd of 25 cows would be \$5,200 if milk were sold, and \$8,031 if butter were sold.

I would not have you infer that I think it a wise plan to place a money value on manure. I would not have any one of you go home and credit your cash account with so much per ton of manure produced during the year or so much per head of stock kept. Such a system of accounts would lead to difficulties and disappointments. It is not necessary to credit your herd and charge your fields with so many tons of manure even though you wish to keep separate accounts of these two operations. Let the manure have no cash value, but turn it over from the herd to the field without charge. In the end the herd will receive proper credit from the increased and lower cost of production of hay, silage and grain.* But the table shows the theoretical value of the manure of a cow per year and the theoretical value from a herd for a term of years. It explains, moreover, how many dairy farms gain in fertility and in yields per acre from year to year, and how an exhausted farm may be recuperated.

*From an address by F. H. Stadtmueller, before Connecticut Farmers' Institutes.

3. PRESERVATION AND METHOD OF HANDLING MANURE.

It must be remembered, however, that the full advantages of dairy farming will not be secured unless the manure is carefully saved and managed. As Professor Roberts says, "The new idea that the droppings of animals should be as carefully preserved from unnecessary waste as any other product of the farm is hard to put into practice after having for forty years stored the barnyard manure under the eaves upon the steep hillside which forms one border of a running brook." The depreciation in value and productive capacity of many of the dairy farms in New York state, the abandonment of many farms in New England which were formerly devoted to stock raising, illustrate the fact that the dairyman may be as great a sinner as any piratical grain grower. The dairyman of Wisconsin whose farm is not growing more productive year by year by reason of purchased fertility in the form of bran, gluten feed and cotton seed meal, is only "saving at the bung that he may waste at the spigot." In apologizing for the condition of the agriculture in the south, Grady says, that "cotton is a darn fool." In a similar manner any crop taken from the soil may be a darn fool, and if a comparison be made between different classes of farmers, the dairymen may deserve the most censure because the least excusable.

It may not be out of place, therefore, to mention some conditions that affect the value of manure and to state what are considered the best methods of handling.

(a) With the dairy cow, 75 per cent of the nitrogen and 90 per cent of the phosphoric acid and potash of the food appear in the manure.

(b) Of the amount voided, 76 per cent of the nitrogen and nearly all the potash appear in the urine.

(c) Not only does the liquid manure contain the larger proportion of fertilizing ingredients, but they are in the most available form for the plant because soluble. For these reasons the liquid manure should not be allowed to waste and tight stable floors and gutters and the use of absorbents are to be recommended.

(d) The fertilizing ingredients in the manure stand in direct

proportion to those in the food. The manurial value of a ton of cotton seed meal is rated at \$28.16; linseed at \$21.11; bran at \$13.31; barley at \$8.18; oats at \$7.43; and corn at \$6.75. The farmer, who goes into the market to buy concentrates, should consider not only the cost of a pound of protein and of digestible nutrients in the foods offered but the fertilizing value also. Especially is this true of the same farmer who is also a purchaser of commercial fertilizers.

(e) *Manure may deteriorate in value from two causes, (1) fermentation, whereby nitrogen, either as ammonia or in the gaseous state, is set free, and (2) weathering or leaching, which involves a loss of the soluble fertilizing constituents. The loss from destructive fermentation may be largely prevented by the use of proper absorbents and by keeping the manure moist and compact.

The addition of litter, or straw, or the mixing of coarse horse manure with that of other animals, tends to admit the air and hasten decomposition which should be avoided. The loss from leaching may be prevented by storage in water tight pits. The storage of liquid manure separately because it ferments more rapidly is no doubt good practice.

(f) Stable manure may have a value beyond the plant food it contains. First, by furnishing the soil with humus, thus increasing its power to hold water; and, second, by making the soil warmer and more favorable for the growth of bacteria. Third, by inoculating the soil with the proper bacteria which have the power of making the moist matter of the soil more available for plant growth. This latter value of manure may be even greater than that of the fertilizing matter it contains.

In the handling of manure it should be borne in mind that there will be no loss of nitrogen if applied as soon as dropped by the animals, provided it can be at once incorporated with the soil. The plan of drawing the manure out daily, or at least at short intervals, has much to commend it. The Ohio station has shown that when manure was thrown into the open barnyard and permitted to lie there for five months before being drawn had a value of \$2.40 per ton. When drawn directly to the field the value was \$3.25. When the manure was sprinkled

*Farmers' Bulletin No. 192.

with crude phosphate rock as it accumulated, thus re-inforcing it with phosphorus and possibly at the same time preventing some loss of ammonia, the value was \$5.18 per ton.

Professor King has conducted some interesting experiments showing the increased yield of corn and potatoes resulting from the application of 5, 10 and 15 tons of stable manure per acre. The trials are the average of four experiments each of eight classes of soils.

Mean increase in yield of corn and potatoes.

	5 tons manure.	10 tons manure.	15 tons manure
Corn	6.80 bushels	12.63 bushels	15.71 bushels
Potatoes.....	35.36 bushels	54.72 bushels	63.97 bushels

The application of five tons of manure was attended with an increased yield of 6.80 bushels of corn and 35.36 bushels of potatoes; ten tons increased the yield 12.63 bushels of corn and 54.72 bushels of potatoes and 15 tons increased the yield 15.71 bushels of corn and 63.97 bushels of potatoes. The author concludes "that for general farm crops, moderate dressings of manure, spread frequently, evenly and widely over the farm, will bring larger returns than when it is applied in large quantities to limited areas at long intervals."

4. The dairymen should bear in mind that soil may lose fertility when idle. It has long been observed that soils under continuous cultivation decline in fertility much more rapidly than those in grass. In the former case the fields are left bare a large part of the time and are thus subject to leaching, washing and oxidation. The loss from the latter cause is greater in new land. It was found by the Minnesota Station that when a prairie soil is first brought under cultivation, the humus oxidizes rapidly and that the loss from this source may be more than four times greater than that removed by the crop. But in older soils, the plant food liberated by the bacteria will be lost by leaching unless the field is kept covered by some growing crop. The dairyman is not subject to these losses as is the grain grower, for the pasture and meadow fields of the former

are protected at all seasons of the year. The dairyman should protect his corn land, however, during the fall and spring, keeping it covered with growing rye or some other crop. In this way the losses from leaching may be reduced to a minimum.

5. The value of leguminous crops to the dairyman.

About twenty years ago, a German experimenter discovered that legumes had the ability to appropriate the nitrogen of the air and transfer it to the plant. This is accomplished by bacteria that form nodules on the roots. Thus a leguminous crop instead of exhausting the land of its store of nitrogen may add to it. Land may be improved by the growth of alfalfa, clover, soy beans or cow peas which are plowed under, increasing the humus and nitrogen of the soil. But these crops will best be used when first fed to stock and the droppings returned to the land, thus serving a double purpose.

I have spoken of one advantage of dairying, viz., that when intelligently pursued it should increase the fertility of the soil. If time permitted it would be interesting to speak of the cow as an economical producer of human food, of the advantages of the continuous labor that dairying furnishes throughout the year, and of the advantages of the extra intelligence required to successfully pursue it.

In the Greek mythology it is related that in the search of his sister Europa, Cadmus, almost in despair, sought the advice of the oracle at Delphi and received this laconic message, "Go forth into the world and follow the footsteps of a cow, and where she lies down, build a city." And Cadmus came upon a fresh heifer in following out this injunction and followed her while she plucked the tender herbage and finally lay down, and on this spot Cadmus built the city of Thebes. As a result of this wandering Cadmus introduced into Europe a knowledge of the alphabet and may be regarded as the founder of all European literature. And I believe that the advice of the oracle at Delphi is good advice for the young men of Wisconsin today, and will lead them to prosperity.

Some thirty years ago, my father engaged in dairying in southern Wisconsin. For twenty years or more he followed the footsteps of the cow on his little farm of eighty acres. He took pride in the fact that he had never sold from this farm an ear of corn, a bushel of wheat or a ton of hay, instead a tub or

two of butter a week and now and then a dry cow. A few days before his death he remarked to "Doc" and me, "Boys, I am going to leave the farm but I shall leave it better than I found it. It has never produced as much as it will today." Then let us learn to pray as Buddha taught his followers to pray, saying in the words of the poetry of the Veda, "I charge you, O, my sons, to follow a herd of cows, quaffing the dust raised by their feet by day, and at night lie down and guard them. O Thou mighty Indra, make our pastures wide, give us wealth in cows. For he that hath cows hath delight in cows, for substance is the delight of man, and he that hath no substance hath no delight."

DISCUSSION.

Mr. Emery: We have been in the past growing more appreciative of the necessity of learning how to feed our cattle, that there is a science in it, and that there is an art in it; but Prof. Beach has come to us this morning and has brought to us that further suggestion, this newer truth, that not only is it the business of the dairyman to acquire this wonderful art of the proper feeding of his animals, but he must go much farther, he must learn how to feed the soil, he must learn how to feed the plants, and this new truth is just as important and just as vital and real a truth as the older one. This we need to give our attention to more earnestly, because there is this point in nature; the soil contains these elements that support animal life, but in a condition unfit to be appropriated by the animal. The animal requires, as one of its means of sustenance, carbon. Now, coal is almost pure carbon, and yet no one thinks of feeding his animals coal, it is not in condition to be fed to the animal, it is not in condition to be taken up by the animal and appropriated to animal tissue, but when that carbon is found in certain forms of vegetable life, then the animal can appropriate this material to its own use and can grow.

Again, the refuse, the excrement from this animal, can be returned to the soil and in turn, if properly administered to the soil, if properly fed to the soil, go to increase that other vege-

table life that we now call bacteria and that do their part unknown to the scientist in this reunion between the organized and the unorganized kingdoms of nature, and thus open to us this larger field. Again, comes to us this appeal to our intelligence, warning us that the dairyman must be a man of intelligence; warning us that the great pioneer force in all this world in dairying as well as elsewhere is the force of the human intellect, the force of the human mind; and that, to be successful in this occupation as in other occupations, he must use strenuously this great endowment that God has given him.

Mr. Everett: I notice in Prof. Beach's winding-up statement a point that I would like to impress upon Marathon county dairymen. It has never before been my good fortune to meet Prof. Beach; I know his brother "Doc." very well, and his father, "Uncle Charley," was one of the best and truest friends that I ever had, a man who was always ready, willing and anxious to give good counsel. It was my privilege to be President of this Association some years ago, and I was named for the position by Uncle Charley Beach, and I well remember what he said to me,—"I ought not to nominate you, but I am going to," he said, and I was renominated by him and elected.

I have spent many hours in hotels up in his room listening to his good advice. He was a wonderful man. He made this statement, "I have never sold a bushel of oats or an ear of corn from the farm," and that farm was richer when he left it than when he first took it up. Now, that is a good point for all dairymen to consider. Too many Marathon county farmers are selling timothy hay from their farms, tons and carloads of it. For a good many years I followed the occupation of dairying in Rock county, and it was one of my practices not to sell anything from the farm except the finished product. I considered myself a manufacturer as a dairyman. I sold butter from the farm, as did Uncle Charley Beach, nothing but butter. Everything that was raised on that farm went through a herd of cows, and was sold as finished product, and I got finished prices, while the residue of the foods that grew upon the farm went back to the land and I tell you that farm increased year after year in fertility as did that of Uncle Charley Beach. Stop selling from your lands timothy hay. It will just as surely impoverish you in the years to come as can be; it will rob

your soil of fertility and when that fertility is gone your prosperity is gone. Remember this, that the man who fails to feed his soil will eventually fail to find food for himself and his family.

Mr. Vanderblum: I want to ask something about the feeding value of potatoes as compared with beets, turnips or other root crops.

Prof. Beach: I do not think I could give you any intelligent advice on that, because I have never fed potatoes myself. In the east, potatoes are worth a little too much for stock feed, still sometimes the smaller potatoes can be fed. In Prof. Henry's Feeds and Feeding, I believe he states that ten bushels of potatoes are equal to one bushel of corn in feeding value.

Mr. Meyers: One of my neighbors fed potatoes when they were cheap, and he told me he found it necessary to stop feeding them. His cows fell off, and he doubled the corn ration and still the cows fell off.

Mr. Quaw: I have never fed as the scientists do, but judging from observation, I believe that with a small proportion of beets or rutabagas, potatoes have double the feeding value that Prof. Henry gives in his book, still I would rather put in my potatoes for sheep.

Adjourned till 1:30 p. m.

Convention met at 1:30 p. m.

President Hill in the chair.

HOW SHALL THE FARMER IMPROVE HIS DAIRY HERD? 1. BY BREEDING.

W. J. Gillett, Rosendale.

Mr. President, Ladies and Gentlemen: Any business ceases to become interesting when it ceases to be profitable and the fascination usually grows proportionately with the amount of

profit realized. It is so in the dairy business. Increased profit brings with it the incentive for better breeding, closer selection, and better and more scientific feeding and care taking. We can conceive of nothing more discouraging than to be tied to a cow 365 days every year without, at least, some remuneration for the time, labor and close confinement that the business requires and a fair margin of profit over and above food cost of production.

Our dairy farmer never tires of the labor and attention spent upon a first class herd of dairy cows, for the reason that it brings him increased resources, makes him prosperous, lifts the mortgage from his home, and establishes his independence. The time can not be cited when a first class dairy cow could not be a source of profit to her owner—the amount of profit increasing or decreasing, of course, with the fluctuating prices of dairy products and milk producing food stuffs.

"How can the farmer of Wisconsin improve his dairy herd," may, in the case of some herds, be a hard question to answer, but with the majority of herds, it is a very easy one and it may be said that, the subject, sub-divided into three sections, namely, breeding, selection and care taking, effectually covers the ground. They are, indeed, closely allied and in fact so dependent upon each other, that the highest degree of success can not be attained without a close observance of them all.

The better the student of these kindred subjects, and the more thorough the application of the many details involved, the nearer will we approach the highest degree of development and performance in the dairy cow.

That the subject of "breeding" is the starting point and foundation of improvement, and that success, in dairying, depends largely upon the equipment, no one will gainsay.

Having from boyhood been connected with a breeding establishment of pure bred dairy cattle, where beauty and uniformity of type must be considered as well as performance and the development of the milk producing function, it is perhaps but natural that I should look upon this subject from the standpoint of a breeder. My experience in the business, where we have been successful in breeding and developing a herd that for several years back, averaged, for the milk alone, from \$90 to \$100 per cow per year, aside from the milk required to feed the

calves, has led me to form some conclusions, which may at first seem somewhat radical.

Nature endowed the cow with the milk giving function to the limit of supplying the amount required for the nourishment of the calf, but through the skill of man this function has been bred into certain breeds of cattle to the extent that, they have become distinct dairy breeds; to the extent that the milk giving function has become a fixed characteristic; and to the extent that the amount of milk necessary for the growth of the calf is but a small part of the amount elaborated by the cow. It is therefore necessary, if the herds of Wisconsin are to be improved by breeding, that selections must be made from some of the distinct dairy breeds, where the milk giving function has become a fixed characteristic.

This is an age of specializing and it is also an age of strong competition. We may have a draft horse that can trot a fair clip, but when we line him up in a contest of speed, with animals bred along speed lines, we find we can be dragged along just fast enough, so the other fellows all beat us.

If we were to engage in a bicycle race, we would go in with a bicycle and not with a wheel barrow, but still a wheel barrow resembles a bicycle as much as a beef animal resembles a dairy cow, and so I say, if we seek dairy performance we must start with dairy material in our animals, and if we start with a little of one and a little of the other, we will have neither, of a special characteristic.

I know of no way the dairymen of the country can become possessed of a herd of first class cows except by a series of grading up. Money can not buy them, for the supply is too limited, and so, if the improvement comes it must be through breeding.

I would strongly urge as the first step toward improvement and performing capacity, the selection of a sire of some of the distinct dairy breeds, as by the use of a sire selected from a strong line of producing ancestry, there is not an ordinary herd in the state of Wisconsin whose progeny can not be improved.

Whether improvement is sought in a pure bred or native herd I must say, the sire in the herd is "the brightest star in the milky way"—even more, he is like the full moon whose bril-

liant rays beam out on a clear night, only to bedim the many bright stars that may cluster about him.

The hardest battle I ever fought was years ago to lead myself to pay the sum of \$300 for a bull calf for use on our pure bred herd, but I can now say, had I paid \$3,000 for this same sire, the sum would not have equalled his worth, nor been commensurate, in value, to the great dairy characteristics he stamped upon his offspring.

From the dairyman's standpoint, "handsome is as handsome does" and performance comes first and is the chief object sought. From the breeder's standpoint, however, performance must not be allowed to obscure type and beauty of conformation. Man's admiration naturally leans toward perfection and so much so, that when symmetry and beauty of conformation are combined with great producing powers in the same animal the value is greatly enhanced. Hence, beyond those points in the conformation of the dairy cow which suggest performance, the breeder must look to the perpetuation of a beautiful type. Not only this, but it is a duty he owes himself and his adopted breed, to fix his standard high and strive for improvement in both form and function.

The ideal form does not always follow function, neither does function always follow form and the two should not be wrongly interpreted. I have about come to the belief that, form is not of greatest importance to insure performance, and certainly it is often a misleading indication of maximum production. Continued breeding along special lines has a tendency to establish strong characteristics. These characteristics may become manifest in either form or function, or both. In illustrating this point, I would call attention to the Short Horn, which was once a prominent breed for dairy purposes. But the time came when breeders turned their attention more to the production of beef, with the result that the Short Horn, with few exceptions, has been barred from the class of profitable dairy animals. Notwithstanding this fact, I fail to see where the structural form of the Short Horn differs materially from what it was in former time. This warrants the conclusion that the milk giving function has been bred out of her, because she is very appropriately classed today among the breeds whose function it is to produce beef.

I have said that form did not always follow function, nor function always follow form. That can best be illustrated by a comparison of some of the most noted producers of any breed, and such an examination will show structural forms of varying contrasts. There will also be found a similarity, or what would be called a prevailing general characteristic, both as to form and function, but each animal will carry an individuality peculiarly its own, and this individuality is likely to become manifest in succeeding generations and thus the saying, "Like begets like;" but here I must add that in breeding, a strongly established characteristic for generations back seems to conduce to less variation in function than it does to the reproduction of uniform excellence of type.

Atavism, or the recurrence of the original type, is something that must occasionally be expected, and very often in form the progeny will resemble a remote ancestor more than its own sire or dam. This will occur less frequently where, for generations back, selections have been made of animals having a close resemblance to the model structural form. The danger of an undesirable cross anywhere in the line of ancestry thus becomes apparent, as it is bound to crop out and lead to variations.

The breeder should have a fixed purpose in view and though he may err in judgment in the mating of his animals, paramount in his mind should be those principles that tend to conduce to the future development, improvement and usefulness of his subject, which, in my estimation, means beauty of conformation, symmetry, size, with refinement and constitutional vigor coupled with longevity and persistent performance at the pail. They can all be favorably influenced by the eternal vigilance and skill of the breeder.

In breeding the use of two extremes do not stop on a common center, hence, violent crosses are very uncertain and can not be depended upon to produce uniformity.

Performance of ancestry is the best assurance we have of the performance of succeeding generations, likewise is a uniformity of high type the best evidence of what may be expected in structural form.

Fixed characteristics, whether good or poor, are not easily changed, and this is one of the reasons why I have referred to

the sire with so much emphasis. If his blood lines are no stronger than the females of the herd, I fail to see how improvement can be expected, and again, the influence of the sire is spread over the whole herd and his prepotency felt for better or worse.

Continued in and in-breeding has a strong tendency to degeneration, from which size and constitutional vigor and even structural form are made to suffer. Line breeding leads to the intensification of hereditary qualities, with less danger of a decline in size and vigor, and distinct breeding, which I would define as continued outcrossing, if the proper selections are made, tends to promote hardier animals.

When we practice inbreeding for the purpose of intensifying certain desirable qualities, we must remember that we are also just as liable to intensify certain undesirable qualities, the results of which may bring sore defeat to our purpose. Certain characteristic defects are best remedied by an outcross that is perfection at the particular point or points we wish to strengthen.

I have referred to beauty of conformation, which means the outward pleasing appearance of the cow, and which is synonymous, to a certain extent, with the form which furnishes external points indicating performance; and again, when we remember that whatever energy is spent by the cow for the purpose of sustaining life, or for supplying the nervous force for the elaboration of milk, must be compensated for by food taken in at the mouth, the importance of great feeding qualities are suggested.

Strong powers of digestion and assimilation are necessary qualifications for maximum performance, and such powers certainly follow hereditary laws. Endurance generally follows strong digestive powers, hence, as a rule, longevity follows endurance.

I have referred to size with refinement, because in my opinion size is a desirable characteristic of the dairy animal, not because of any additional hardiness in connection with it, but principally because of the enlarged capacity of the machine. I have modified size by having an accompaniment of refinement, for the reason that often with great size is liable to come a certain

coarseness, which in my experience is not conducive to the most economic utilization of food.

Performance may be sub-divided under three heads: the quantity of the milk, the quality of the milk, and the persistence of the flow, all of which are influenced by judicious feeding and care-taking but more so by a special line of breeding. In fact it is a leading question, if quality is not entirely a matter of heredity and even so with quantity.

Every cow is born with a latent capability which lies dormant till, by development through the influence of feed, it is brought out.

I consider it impossible for a cow to be two things—a choice dairy cow and a first class beef animal, because the functions are widely different. Hence, I can not refrain from mentioning, incidentally, the folly of the dairyman attempting, upon the high-priced lands of Wisconsin, to use an animal that is not especially adapted to his purpose.

Nor can I refrain from mentioning that the matter of pedigree should not be allowed to mislead us. If there is anything in existence that will financially grind the dairyman into powder, it is the pedigreed scrub, and certainly there is as wide a difference in the quality of pedigreed animals as between a good cow and an inferior cow, and in some cases in fact where pedigree is but a name. Pedigreed animals are those which, by right of birth, are eligible to registration. It is no distinction of individual worth or merit, and so, while pedigree is misleading in a way, it is, on the other hand, a reliable guide when carrying with it merit, which must be judged from the individual excellence and performance of the recorded ancestry.

This subject is both broad and important and it has been my purpose at this time to treat upon it in a general way, avoiding the many details which must accompany it; and in conclusion I will say if a dairyman starts out today with the resolution and means to purchase a first class herd of cows, he will no doubt be able to procure them, but when he does so he only deprives some one else without increasing the existing number of good cows one single animal, and so it seems the foundation for improvement must lie in a system of better breeding.

DISCUSSION.

Secy. Burchard: I don't want to ask a question about breeding, but I do want to ask a question to bring out more specifically what Mr. Gillett says about the products of his herd. We know that some people tell about what their cows average them in their product, it is \$50 or \$60, or \$100, but that doesn't tell us anything about the market where they sell these products, or how they dispose of them, or other details that make a great deal of difference.

Mr. Gillett: Our market is the ordinary cheese factory, and our prices are the prevailing prices for milk delivered at cheese factories. The result of our herd the past year—which you must take into consideration is a pure bred herd, where all the calves are raised and developed and supposed to be pretty well fed because they are expected to bring pretty good prices—our herd during the past year has averaged nine thousand and something over five hundred pounds per cow, and the average price of the product, as I remember it, is somewhere between 93 and 94 cents a hundred. The herd this past year has numbered twenty cows, of which forty per cent are two-year heifers, ten per cent are three-year-old heifers and ten per cent four-year-old heifers, so it would be hardly fair to say that they were equal to twenty cows, because there were so many young cows among them. On account of delivering milk to the cheese factory, we have to feed more milk to the calves, and we feed them up to five months old, our milk ration is fifteen pounds per day. This would make 450 pounds per month, but it frequently happens that a certain per cent is sold before they arrive at that age, so for the past year I have estimated the amount of milk to be 1,800 pounds per calf, which would bring the average up.

Ex-Gov. Hoard: Isn't that rather a small ration?

Mr. Gillett: That isn't all we feed. We substitute oil meal and add more water to the milk as we think the needs of the calf require. We also get them onto oats and clover hay and a little ensilage as soon as possible.

Ex-Gov. Hoard: If you were feeding skim milk, wouldn't you feed more?

Mr. Gillett: Yes, I would nearly double it.

Mr. Meyers: What average test have you?

Mr. Gillett: I can't say what the average test would be. But our milk ranges at the factory from 3.4 to 3.8, according to the season and according to the condition of the cows.

Ex-Gov. Hoard: In estimating the qualities necessary for the production of a good cow in your breeding, do you not estimate the power and value of the sire to be equal if not greater than that of the mother?

Mr. Gillett: I believe it has a stronger influence. Yes; and if I were to place an estimate on the sire of the herd, I would say he constituted at least fifty per cent if not five-eighths of the herd.

Ex-Gov. Hoard: The average farmer doesn't believe that at all.

Mr. Gillett: I am going to say one thing in regard to the sire. I may be mistaken in this, but my observation leads me to think that a sire not only influences the functions strongly, but he also influences the extremities. What I mean by that is, the head and the ear and the limbs of an animal, the outline. I am going to say further that I believe that I can judge the function of a cow as easily from the forelegs that she walks on as any one thing that constitutes her make-up. I mean the sinewy surface of the leg that shows the development of the veins and is an indication of nervous force.

Ex-Gov. Hoard: I wish you would enlarge on that a little more. You take the farmers of Wisconsin today, the patrons of the cheese factories, the milkers, they are interested in producing good cows, if they only knew it. That average farmer will breed to the poorest scrub sire. He will go and buy a scrub sire for \$25 instead of buying a first class good sire that he has to pay \$75 or \$100 for, and he thinks he is making money.

Mr. Gillett: I never could understand how a man could afford to run a herd of cows for an indefinite time without having something of an income from it, and I am satisfied that there are any number of cows and whole herds in the state of Wisconsin that are running their owners in debt every year, and they are so short-sighted that they fail to see why they are not making money as some other fellows are.

Mr. Quince: I suppose that the sire is fifty per cent of the dam. It is better to have a good full-blooded sire to produce a lot of calves of mixed breeding of every kind, than to have the issue of the sire be greater than fifty per cent in that case.

Mr. Gifford: Yes, up all means it would.

Secy. Burchard: Mr. President, I cannot think of anything more apt to come in in connection with this subject than to quote a very eminent authority on the subject, eminent from the standpoint of sound dairying. Of course, these old gentlemen who have been with the Association a good many years know to whom I refer. Mr. Hiram Smith, of blessed memory. In the early days of this Association, it held a convention at Fort Atkinson, in Jefferson county.

Ex Gov. Hoard: That was in 1874.

Secy. Burchard: Jefferson county then was perhaps further back in dairying than Marathon county is today, and among the questions propounded to Uncle Hiram at that time was this: "Mr. Smith, how would you advise a man to go to work to get up a dairy?" As was sometimes the case with Uncle Hiram, his reply was as direct as it was emphatic, he simply used three words to reply to that question, and those words were, "Buy a bull."

Mr. Taylor: A year ago now, at our annual convention at Platteville, I was asked to take a census of the dairymen in and about Platteville. Because of sickness in my family, I was prevented from making that report, but I remember now one thing that impressed me greatly, and I want to mention it. I visited some fifty or sixty herds. I was seeking the patrons who had taken their milk to a certain factory for a whole year. I only found twenty three men that took their milk to the factory the whole year, so I had to base my census report upon the twenty three, but in visiting the herds all around Platteville, I found just three pure bred sires in those herds, and those were Shorthorns, every one of them, not a pure bred dairy sire did I see, not one. And yet those men were inviting their sons and their daughters to engage in the dairy business with them, and asking them to put in their time and energy, devoting them to the dairy business, and not one pure bred dairy sire in that whole section of country. What do you think of that? We

don't have to go back to Hiram Smith's time, but we find in our own time this section of Wisconsin where there are four or five creameries receiving milk from dairy farms and not one pure bred sire at the head of the herd. Now, fellow dairymen, if you have twenty-five or thirty or forty cows, get your thinkers started upon this subject of breeding better than you have, and place a pure bred sire of some of the pure dairy breeds at the head of your herd. Select the best heifer calves from your best cows and keep them as a starter for a better herd. Next year keep every one of those good heifer calves from your good cows from this pure bred sire, and keep that up next year and next year; then you will have to have a new sire, and for the sake of your financial story, get a pure bred sire to use upon those grade daughters of the same breed as the first sire, and if you want advice from a man of experience, go to some one that is breeding in the same line of breeding that your previous sire had, and if you cannot intensify the dairy tendencies in that way, you can't do it in any way, and I don't know of anybody in the state that can't do that much. We want to get you thinking about this.

Ex-Gov. Hoard: In 1876, a man in Jefferson county came to me and said, "I have been trying to make some money out of my herd of cows. They are grade Shorthorn cows and the best I can get them to do is 150 pounds of butter per cow, and I have worked hard." Now, he asked me what he should do, and he said very feelingly, "I can't stand it to work the year around for such small results. Shall I sell off these cows and go and buy dairy cows?" "I think not," I said. "Well, what will I do?" I said, "You want to raise dairy cows, don't you? You don't want to fool away your time with poor cows, you want good cows?" "Yes." "Well, you go and buy the best Jersey bull that you can find—and if you pay a good high price for him, the better—and put him at the head of your herd." He did so; he paid \$200 for a very fine, prepotent, strong-blooded Jersey bull. Now, my good farmer friends, I want to show you something. When the daughters of that sire came into milk, at four years of age, his average was 275 pounds of butter per cow. That is what blood did when bred in the right direction.

Now, you will hear men say there are dairy strains in Shorthorn cows, and it is true; there may be good dairy cows among the Shorthorns, but, my friends, there isn't a Shorthorn bull in existence that is a breeder of dairy cows. You can't find one all over the state of Wisconsin that isn't as beefy as he can be, coming way down and back from fifty years of beefy ancestors on beefy lines, and that is the kind of breeding that farmers are fooling themselves with all the time, and still wanting to be dairymen, still wanting to get the most money from the creamery or the cheese factory that they possibly can, and at the same time fooling themselves with this idea of breeding for beef and getting milk.

HOW SHALL THE FARMER IMPROVE HIS DAIRY HERD. 2. BY SELECTION.

Prof. C. L. Beach, Connecticut.

TWO STANDARDS OF SELECTION.

Improvement and uniformity in breeds of livestock is impossible only as the result of the existence of a standard of excellence. This standard may relate to the form or type of the animal or to performance. The former standard is expressed in the score card or scale of points, or from time to time by the breeders at the auction sale, or by the judge in the show ring. The standard of performance relates, with beef animals, to the quality and per cent of dressed meat at the slaughter contest; with sheep, to the quality and quantity of wool at the shearing; with horses, to the speed shown by the runner or trotter upon the track, and in dairy cattle to the amount of milk and butter fat production of the cow. Improvement will be the most rapid, either in the breeding or working herd, when these two standards are recognized, when their causative relationship is understood and when accessions to the herd conform to both.

RELATION OF FORM TO FUNCTION.

Different breeds and species of domestic animals are valuable because of the special development of the function of some organ of the body. Dairy breeds are valuable because of the development of the function of milk secretion. It has been found in practice that certain functions are antagonistic and that their highest development in the same animal is impossible. This is illustrated in the antagonism of beef and milk production, wool and flesh, speed and draft, mental and physical power. On the other hand certain functions are harmonious, as digestion and milk secretion. Experience teaches, also, that the stimulation and training of a function may result in the modification of the organ in which the function is seated. This development and suppression of functions, this interdependence of development, this modification of structure as a result of training, is known as the law or principle of correlation. The value of a knowledge of this law is apparent—it forms the basis of all livestock judging.

LAW OF CORRELATION AND DAIRY TYPE.

By stimulation and training of the function of milk secretion, the dairyman has modified and increased the capacity of the udder of the dairy cow. More abundant and palatable food has stimulated appetite and increased digestive capacity. Increased digestion and milk secretion has called for and been attended with a larger flow of nervous energy. Later, as the result of generations of training, the demands of the udder have been more urgent than those of the body, and the latter has been depleted of all unnecessary flesh. And so the dairyman may judge of the capacity of the cow for economic production by the development of those organs whose functions are correlated with milk secretion, viz., the capacious udder, the large digestive organs, the well developed nerve system, and the spare, angular, depleted body of the dairy type.

TABLE 1. — *Type of cow and cost of production.*

Group.	Minnesota.		Connecticut.	
	No. of animals.	Av. cost of 1 lb. fat	No. of animals.	Av. cost of 1 lb. butter
I. Beef type or fleshy group ..	3	17.5 cents.	4	18.1 cents.
II. Less of beef type	4	15.1 cents.	.....	.....
III. Lacking depth of body ..	3	14.6 cent.	5	14.9 cents.
IV. Dairy type	12	12.1 cent.	16	12.0 cents.

Prof. Haecker of Minnesota made a very close study of the type of the cow in relation to cost of production. A herd of twenty-two cows were divided into four groups, and the average cost of each one pound of fat produced during the year was determined. The Storrs Station made a similar study upon lines laid down by Prof. Haecker. The results in the table above call for no extended explanation. In the Minnesota herd three animals of the "Beef Type" charged on the average 17.5 cents for each pound of fat produced; four animals of "Less of the Beef Type" charged on the average 15.1 cents; three animals in the group designated as "Lacking in Depth of Body" charged on the average 14.6 cents; and 12 animals of the Dairy group charged on the average 12.1 cents for each pound of fat produced. At the Connecticut Station, four animals of the Fleshy Group charged on the average 18.1 cents for each pound of butter produced; five animals of the group "Lacking in Depth of Body" charged on the average 14.9 cents; and 16 animals of the Dairy Type charged 12.0 cents.

This theory of dairy type is demonstrated again by the similarity of the champion cows in the breed contests of St. Louis and Chicago.

Note the development of the correlated, harmonious functions—capacious udder, large digestive capacity, well developed nerve system, and the spare, angular, depleted body resulting from a suppression of functions antagonistic to dairy performance.

INDIVIDUALITY OF THE COW.

While "type" is an indication, it is not an exact measure of economic dairy capacity. Careful, intelligent and painstaking judgment was exercised in the selection of the herds for the St. Louis breed contest. The table below shows the production and cost of feed of the best and poorest cow of each breed. The difference in cost of feed was for the Jersey, \$1.76; Brown Swiss, \$1.28; Holsteins, \$1.89; and Shorthorns, \$0.88; and the difference in the net profit is, Jersey, \$23.80; Brown Swiss, \$8.02; Holstein, \$27.99; and Shorthorn, \$30.61.

These figures show that judging by type or signs is not an exact science and should be supplemented by records of performance.

TABLE 2.—*St. Louis breed contest.*

Best and poorest cow of each breed.

Breed.	Yield of milk.	Yield of fat.	Cost of food.	Profit.
Best Brown Swiss	6126	209.8	\$33.49	\$27.77
Poorest Brown Swiss	4618	177.3	32.21	19.75
Difference			\$1.28	\$8.02
Best Holstein	8101	282.6	36.57	46.02
Poorest Holstein	5653	180.0	34.68	18.03
Difference			\$1.89	\$27.99
Best Jersey	5802	280.0	31.99	50.52
Poorest Jersey	4653	193.8	30.23	26.72
Difference			\$1.76	\$23.80
Best Shorthorn	5207	208.0	28.57	32.56
Poorest Shorthorn	2571	101.0	27.69	1.95
Difference .....			.88	\$30.61

The value and importance of an individual account of each animal is illustrated in tables 3, 4 and 5 taken from the records of the Storrs College Herd. Table 3 gives the average food cost and profit of the five best and the five poorest cows in the herd for a period of five years.

The difference in the average food cost of the five best and the five poorest cows was \$4.52 in the first year; \$14.92 in the second year; \$9.86 the third year; \$8.07 the fourth year, and \$3.35 the fifth year. The corresponding differences in the average profit of the best and poorest was \$31.00 per cow for the first year; \$49.02 the second year; \$28.57 the third year; \$30.00 the fourth year, and \$22.56 the fifth year.

TABLE 3. — *Difference in average food cost and profit of five best and five poorest cows for five years. (20 cows in herd.)*

Year.	Cost of food.	Yield of fat in lbs.	Profit.
1899.			
Five most profitable cows	\$56 54	304.2	\$26 91
Five least profitable cows	52 02	188.6	4 00*
Difference	\$4 52	115.6	\$31 00
1900.			
Five most profitable cows	\$60 30		\$43.27
Five least profitable cows	45 38		5 75*
Difference	\$14 92	213.0	\$49 02
1901.			
Five most profitable cows	\$53 24	375.3	\$44 25
Five least profitable cows	43 38	217.2	15 68
Difference	\$9 86	158.1	\$28 57
1902.			
Five most profitable cows	\$59 52	376.2	\$43 71
Five least profitable cows	51 45	239.6	13 71
Difference	\$8 07	136.6	\$30 00
1903.			
Five most profitable cows	\$59 46	365.5	\$40 23
Five least profitable cows	56 11	268.9	17 67
Difference	\$3.35	96.6	\$22 56

* Loss.

As a result of a weeding out of the unprofitable cows, the average yield of butter increased with corresponding gains in profit and net profit

TABLE 4. Showing gains in yield of butter, gains in profit and net profit or period of five years.

	1899.	1900.	1901.	1902.	1903
Number of cows in herd	20	25	21	20	19
Yield of butter, lbs.....	281	317	327	342	365
Cost of food	\$55 21	\$53 87	\$47 79	\$54 06	\$57 10
Average profit per cow	11 16	20 70	29 15	26 53	28 73
Average net profit per cow	*1 23	11 82	17 35	16 84	21 64

* Loss.

During the five years covered by the above records, the variety and amount of food and the care of the herd have been much the same. The increase in net profit from \$1.23 loss in 1899 to \$21.64 in 1903 must be attributed to the weeding out of unprofitable cows and the selection of animals better suited to dairy purposes. The average cost of animals added to the herd since 1899 was \$42.50.

The possibilities of substantial profits from a well selected herd are shown in Table 5. The records of the 50 cows for 103 lactation periods are grouped according to amount of profit into five divisions.

TABLE 5.—Difference in net profit from cows making best and poorest records.

	Total net profit.	Individual net profit.
23 poorest records.....	\$303 03*	\$13 17*
20 fourth best records	111 56	5 67
20 third best records.....	292 57	14 62
20 second best records	439 26	21 96
20 best records	788 06	39 40

* Loss.

TABLE 6. Size and dairy capacity.

No. of Animals.	Av. weight Pounds.	Cost of food.	Yield of fat. Pounds.	Profit.
25 Jerseys	925	\$53 97	315.7	\$20 68
25 Jerseys	785	52 67	297.3	28 93
Difference.....	140	\$4 30	18.4	\$0 75

Table 6 shows the difference in net profit of a group of Jerseys weighing 925 pounds and a group of the same number weighing 785 pounds. It is generally considered that a large cow should be more economical than a small one, other things being equal, as the relative maintenance needs should be less. In this comparison there was a difference of \$0.75 in the average profit for one year and in favor of the larger cows.

TABLE 7.—*Quality of milk and butter production.*

No. of Animals.	Average per cent of fat in milk.	Yield of fat in milk. Lbs.	Profit.
28 Jerseys.	4.85	306.65	\$29 27
28 Jerseys.	6.31	306.35	29 32
Difference	1.46	.30	\$0 05

Table 7. It is generally considered that cows giving rich milk should be able to produce butter fat more economically than those producing milk less rich in fat. In the above comparison, however, the quality of milk was not an index to productive capacity. There was an average difference of only \$0.05 in the net profit for one year and 0.3 pound difference in fat production of two groups of Jersey cows, one of which averaged 4.85 per cent of fat by the Babcock test and the other group 6.31 per cent.

TABLE 8.—*Quantity of milk and butter production.*

No. of Animals.	Yield of milk. Pounds.	Yield of fat. Pounds.	Profit.
28 Jerseys.	6,608	344.8	\$37 15
28 Jerseys.	4,632	268.7	21 45
Difference ..	1,976	76.1	\$15 70

Table 8. The most profit was made from those cows giving the most milk regardless of quality. Twenty-eight Jersey cows averaging 6,608 pounds of milk per year produced a profit of \$37.15; while 28 Jersey cows averaging 4,632 pounds of

milk in a year made a profit of \$21.45, or a difference of \$15.70 in favor of the larger milkers.

SELECTION OF A DAIRY SIRE.

The selection of a sire is a most important factor in the up-building of a dairy herd. It is an old adage that "the bull is half the herd," and this is the case when neither parent is possessed of marked impressive power. But the sire is usually more purely bred and possessed of greater individual vigor and in a majority of cases has a greater influence on the offspring than does the female with which he is mated. Greater care should be exercised, then, in the choice of a male than a female, because the progeny of the former is more numerous, and because the sire is often the more prepotent. To improve the dairy qualities of a herd by breeding, the selection of a sire should be made from one of the established and recognized dairy breeds. The choice of an individual may relate to pedigree, form or type, and prepotency.

PEDIGREE OF PERFORMANCE.

A pedigree is a register of ancestors. A pedigree of performance includes the pedigree of lineage and in addition facts in regard to the records of production of the individuals mentioned in the pedigree. It has been stated that the corner stone of the breeders' art is the law "that like begets like." This law of transmission relates to structure, function, habit, constitution, disease, and in fact to all features of the organization. Usually the offspring inherits the qualities of the parent, but frequently the character of some ancestor becomes dominant in the offspring, and the quality of the parent becomes latent. It should be borne in mind, also, that qualities peculiar to one sex are transmitted through the other, i. e., the functions of a family noted for dairy production are transmitted through the male members of that family. For these reasons a study of pedigrees becomes important as it enables the breeder to estimate the probabilities of transmission.

PREPOTENCY.

Prepotency is the power which an animal has of transmitting its own qualities. Dairy prepotency is the power of an animal to transmit dairy qualities. The influences that tend to produce or insure prepotency in the individual are purity of blood, duration of such breeding, in and in breeding, strong constitution and vigor. The purity of breeding, the duration of such breeding, the closeness of relationship in the ancestry, all tend to strengthen prepotency in the individual. A knowledge of these qualities we may gather from the study of pedigrees. But prepotency is indicated by vigor, style, alertness and resolute appearance of the individual. "A dull sluggish spirit and action is indicative of a lack of dairy prepotency." Note the bold, masculine appearance, indicative of impressiveness, of the two Champion bulls, Merry Maiden's Third Son and Prince of Rosendale.

Prepotency in a sire is not assured until proven in his progeny. Uniformity and excellence in the offspring is the supreme test of prepotency. All the requisites may be present that tend to assure this impressive power and yet it may be lacking. For this reason a young sire should be used cautiously and an aged sire whose qualities have been proven should never be discarded until past the period of usefulness.

FORM OR TYPE OF BULL.

The type of a dairy bull is well shown by a study of the cuts of the champion Jersey and Guernsey bulls at St. Louis. Both show the large bowel indicating digestive capacity; 2nd, the thin, incurving thigh, and high cut flank, which if transmitted to their female offspring insure ample room for the development of the udder; 3rd, the eye, head and neck and front quarters show masculinity which, aside from pedigree, are the best indices of prepotency; 4th, the absence of unnecessary flesh indicative of dairy breeding which should insure economy of production.

RESUME.

Improvement in the dairy herd will be the most rapid when attention is given to the following considerations:

1. Accessions to the herd should conform to "dairy type" (Table 1).

2. Records should be kept with each individual of the herd and the unprofitable animals weeded out (Tables 2, 3, 4 and 5,)

3. Size does not seem to be an important factor in dairy performance (Table 6).

4. On the average, among butter breeds, the large producers of milk will make the most profit from the production of butter (Table 8).

5. The quality of milk secreted is not as important a factor as quantity (Table 7).

6. Heifer calves out of the best cows and by a dairy sire should be raised to replace the herd.

7. The dairy sire should be selected because of the excellence (performance) of his ancestors; he should have the dairy form or type and should in addition show prepotency in his style and action.

DISCUSSION.

Mr. Taylor: The Professor has told us that the first evidence of a bull's prepotent power is in his external appearance. Now, what is the next evidence?

Prof. Beach: Will Mr. Taylor answer that question himself?

Mr. Taylor: The next evidence can be seen when his calves are six to eight months old. If the bull calves are masculine, rugged, vigorous, strong fellows, and the females are feminine, cowy, motherly-looking heifers, then you have positive evidence that the sire's prepotency is of the right quality.

HOW SHALL THE FARMER IMPROVE HIS DAIRY HERD? 3. BY FEEDING.

Prof. G. C. Humphrey, Madison.

In addressing the Association on the third topic of the symposium so uniquely arranged for our consideration, I trust that at least a few points can be made which shall lead to a full discussion later. I feel that it is only in this manner that justice can be done a subject so important in our study to improve our dairy herds. The subject of feeding dairy cattle is one that has many phases and will never cease to be a subject of great interest and furnish wide scope for discussion, but in the discussion which follows, I trust we may confine ourselves to the most practical phases of it and aim to accomplish the most good for the dairy cattle of the state as they exist under the supervision and ordinary management of the Wisconsin dairy farmer.

I would not have you divert your minds from what has been brought out in the discussion of the preceding topics, for all that relates to breeding and selection of dairy animals is essential in laying a sure foundation, which we are dependent upon for our success, and without which our efforts will prove in vain. However experienced the feeder, if his animals have not been bred right and his selection has been unwise, he never can accomplish the end he may have in view. Having laid a sure foundation by wisely selecting and breeding his animals, the feeder is ready to carefully consider the subject of feeding. Feeding successfully is a much more tedious process than selecting and breeding. It requires constant effort and the closest attention to detail, in order for one to be most successful. It means thoughtfulness at every act of placing feed before animals, and considerable thinking between times.

THE NATURE OF THE IMPROVEMENT NEEDED IN OUR DAIRY HERDS.

There is little need of talking improvement until men are convinced that improvement is necessary. Men are unable to see

where it is worth while to go to all the expense of systematically feeding their herds until they are brought to realize the need of such work. The first fault to be found in a great many herds of the country is a failure to feed the right kind and a sufficient amount of food to insure a chance of cows being profitable. Too many cows are receiving merely a maintenance ration, poor at that, which does not permit their making any profitable production, however good they may be as dairy individuals. In another case men are feeding extravagantly and wasting enough feed to keep fifteen cows where they are keeping ten. Again, in many cases men are endeavoring to grow young stock, with which they expect to replace the older members of the herd, and the system of feeding these young animals is to be severely criticised. Calf feeding in too many cases is a side issue.

Three things every dairyman must do in feeding if he is to make improvement in his dairy herd and dairy operations. First, he must aim to grow young animals into strong, healthy individuals, which will improve his herd as they take their places in the herd and replace others. Second, he must feed enough of the right kind of feed to stimulate and encourage every animal in his herd to do all her capacity warrants. When her capacity has been thoroughly tested and she fails, she must be discarded and replaced by one more promising. In the third place, the dairyman must avoid feeding beyond the limit of the cow's capacity for converting feed into milk. We often find cows consuming much more than they are paying for at the pail, and men who are not watching this closely are not working toward improvement in their feeding operations.

GROWTH AND NATURAL DEVELOPMENT.

It will pay every good dairyman to raise the heifer calves from the best dairy cows of his herd, and by so doing his chances are much better for improving his herd than they are where he depends upon buying new cows to replace his old ones. It is almost impossible to go out and buy the best cows. Men will sell you the poorest and reserve the best, as a general rule. This rule has few exceptions, especially where the practical dairyman is doing business and paying from \$40 to \$60 per

head for his cows. Few dairymen can afford to go out and buy cows to replace old ones in the herd when they have any chance whatever to save and raise the calves from their best cows, and buy good bulls which should be used in every instance. It will pay the dairyman to grow his cows, providing they are grown in the right manner.

In developing any of our domestic animals, growth is a natural thing on their part the same as it is in every living organism, be it plant or animal growth; it cannot be encouraged too much. Every animal is entitled to the privilege of making a maximum amount of natural growth, whether that growth is in the direction of what we may term a heavily fleshed form, a medium sized form, or a spare fleshed form. As to what the form shall be after proper development, will be largely determined by the ancestors or progenitors of the animal in question. For example, some calves will make a maximum growth and have a tendency to develop a form spare in flesh; others will have perhaps more size and considerable more flesh, and again others will have still more flesh, which covers the framework of the body and gives the well rounded form, so well adapted for the production of beef.

Whatever the growth may be, it has to be made between the day of birth and the time of maturity, and is due to a given amount of feed which, for a maximum growth, must be liberal and of the right kind. The suppliance of the proper kind and amount of feed, or the lack of this proper supply, will be in evidence when the calf reaches maturity. Too often it is true that the supply has been inadequate, and the result is indicated by a lack of size and natural flesh and development of vital organs, which tend to weaken the strength and constitution and render the animal less useful in serving its purpose. I am honest in my convictions when I say that I believe that there are too many cows in the country today, too refined and delicate, which in the hands of the practical dairyman are a failure, owing to a lack of size and greater strength of form and constitution, which should accompany every natural growth. There are individuals of every breed that are delicate and a failure for this reason. A great many dairy animals are being developed today with that refined, delicate form which we are inclined to recognize as characteristic of dairy quality, and too often

allow our fancy to judge accordingly, when I believe it is a mistake. The breeder, who is wise, will look well to the feeding, breeding and selecting of his animals to get a stronger and more desirable growth.

Food is one of the chief causes of variation in animals. In the practice of feeding, combined with breeding and selection, it is possible to develop a high standard of excellence, and having once gained such a standard, nothing is more necessary in maintaining it than a sufficient amount of feed. It gets in the best work during calfhood and up to the time an animal reaches maturity. During this period of life an animal was never over-fed so long as the food supply had no bad effect and encouraged a good, thrifty growth. An animal can be over-fed in the sense that it be given feed to satisfy a greedy appetite; to the extent that it will become over-loaded one day, and off feed for the three following days, but starting a calf right and feeding him regularly day after day such kinds and amounts of feed that will develop a maximum growth will never result in harm.

A general rule for successfully raising calves is hard to give. In general, cleanliness is one of the first things to be observed. It is not natural for a calf to grow up successfully where it is confined to filthy, dark pens, and has to depend upon milk and water and other feed from soured, filthy buckets and troughs. Few men, perhaps, are a success in raising good calves. The attention to the best welfare of the calf seems to be as essential as the feed itself and will bring results that can be had in no other way. Such attention sees to providing the proper amount of milk at the right temperature after the calf is weaned; inducing it to eat a little bright hay and some grain at about ten or twelve days old; and later on, as skim milk is substituted for whole milk, gradually increasing the amount of bran and oats and a little oil meal perhaps, as the calf seems to eat and thrive well. The condition is carefully noted and so far as possible the growth is never allowed to falter. At the age of six to eight months the calf is turned to pasture, if in season, where good grass is abundant. If such pasture is not available, the calf is remembered with a grain supplement that will prevent any check in its growth. Thus by continuous feeding it reaches the state of maturity, strong, healthy, good-sized, and possessed of a good constitution, enabling it to ward off disease

and have the energy and strength necessary for heavy work. Is there any danger of spoiling a bull or heifer calf for dairy purposes by such treatment? No, not in the least, providing the animal is bred right and possesses that inherent tendency called dairy tendency. Without that inherent tendency, any animal is a failure from the standpoint of dairy production; with that present, the stronger and more fleshy an animal is the more useful they will be as dairy cows. They sometimes fail to impress us as strong dairy animals as heifers, but they continue to grow stronger as dairy producers, and in their prime are the best cows the country affords.

DEVELOPING THE DAIRY TENDENCY.

The usefulness of every cow after reaching the state of maturity depends upon the predominating tendency she possesses, whether dairy or beef, and the use that is made of that tendency by the feeder. Every animal is possessed of dual tendency in a greater or less degree, which is evident from the fact that the best of cows will commence to take on a surplus of flesh at the close of their lactation period, providing they are in good health. One of these tendencies, however, usually predominates, and feeding after the heifer has freshened is one of the best methods of revealing which tendency is going to be the predominating one. It can usually be told during the first lactation period, but there are cases on record where animals fail to show their predominating tendency until after their first year, or perhaps second year, as milk producers. In trying to account for this peculiar performance on the part of some individuals, it would almost seem that they were slow in reaching the state of maturity that made them ready for doing the work of a dairy animal.

We find strictly beef animals among dairy breeds, so far as this inherent tendency is concerned, the same as we find strictly dairy cows among some of our more beefy breeds. It is this fact that leads me to believe that the usefulness of the mature cow is determined more by her inborn tendency than by any other factor. I am not sure but the time is near at hand when the score card will have to be revised and our methods of judging dairy cows changed considerably, if we are going to

work the greatest improvement in developing strong dairy cows. Feeding and performance is the surest test we have in determining dairy tendency today, and we are often confused in our judging when we confine ourselves to the score card that describes a form indicative of great performance. If this be true, feeding to bring out the true value of every dairy cow, aids selection and becomes one of the most important factors in the improvement of our dairy herds.

I should be most happy if I were able to tell you just the best system of feeding to bring out and develop all that is possible in a cow which has dairy possibilities in her. If I could answer this question satisfactorily, there would be no farther need of experimentation and investigation along the line of feeding dairy cattle. It would answer the question as to which is the more satisfactory, a wide or narrow ration; it would compound a ration for each dairy cow in the state, and these are things which I do not intend to do. No fixed ration can be given for any one herd. Cows will vary too much, for one thing, in what they require as individuals and at different stages in their lactation period, and the great variety of feeds at our disposal is another thing to prevent our discussing fixed rations.

It may be of interest and serve as a basis for some to know that the average daily ration fed the twenty-one cows in our herd a year ago this winter contained 22.65 pounds of dry matter, 2.19 pounds of digestible protein, and 13.20 pounds digestible carbohydrates and fat. The nutritive ratio of this ration was 1:6.0. The average weight of the cows was 1,076 pounds, and the average production per cow was 20.58 pounds of milk and .908 pounds of fat. This ration amounted to about five pounds of hay, forty pounds of corn silage, and eight pounds of grain, which was principally bran, distillers grains and cotton seed meal, mixed in the proportion of 2:2:1. The cow, Lady, which gave the highest average amount of milk and butter fat, 36.7 pounds of milk and 1.56 pounds of butter, received about fifty pounds of silage, five pounds of hay and ten pounds of grain.

The method of feeding the herd at our University Farm is one to be recommended to the dairyman of the state, although he need not be as accurate perhaps in all of his calculations. It is

aimed to make the bulk of the winter ration silage, hay and fodder, and the summer ration for roughage, pasture, supplemented by soiling when necessary. The amount of roughage is determined by the amount the cow will eat with good relish, and at the same time consume her grain ration, which is given in amounts according to her production. These amounts of grain will vary somewhere from four to fourteen pounds per day.

The stage in the period of lactation, the amount of milk flow and the increase or decrease in body weight are the indicators that govern the amount of grain to be fed. All feed, with the exception of pasture, is weighed. It may seem to the practical man that this is requiring a great deal of time, but it is quite possible for a careful observer to note what his cows are doing with the feed they are consuming without all the trouble of weighing each feed. A man can weigh out grain to cattle very accurately without scales, providing he has measures which he understands, and it is very easy to have such. A scale for weighing milk and other farm products is a profitable thing to have, and I am confident it would pay every dairyman to weigh his milk at least once a day, if not twice, in order that he can have some idea as to what results he is getting from the feed he is putting into his herd. With such a system of feeding and keeping records of the production, improvement is bound to follow. Cows will have to respond or men will know the reason why. They can be fed to the limit of their capacity, which will be determined in every case. Where capacity is wanting, feed will be saved by being withheld or put into a better grade of cows. Extravagant feeding will be avoided. Without such a system, it seems the dairyman is no more consistent in his business than a grocer would be who bought and sold goods regardless of weights, cost, or giving any attention to his cash register.

In conclusion I would say that I have not tried to make a great many points, but believe that there is a great possibility for feeding our dairy herds and improving them in a few points I have tried to make. Let us bear in mind that we must endeavor to grow animals and develop them so far as possible into strong, healthy, vigorous animals, which shall be able to resist disease and be immune to it. This is necessary since disease is

becoming more prevalent each year. Again, let us feed to bring out and develop all the dairy tendency that may be present in animals in our possession, discarding those which are a failure and replacing them as fast as possible with the animals which have been bred right, selected right, and which are bound to respond to intelligent feeding.

DISCUSSION.

Ex-Gov. Hoard: Is the ordinary dairyman a liberal feeder?

Prof. Humphrey: Not until he is educated to that point. I should say the average patrons of the creameries of Wisconsin are not liberal feeders.

You can take another class of men and they have to be intelligent, educated feeders, they are dealing with an animal that is too refined, too delicate in formation to stand anything else. She will be a failure under any but the most intelligent feeders.

Mr. Taylor: How came she to be too fine?

Prof. Humphrey: It is through her selection, through her development.

Mr. Taylor: Lack of development, I should call it.

Prof. Humphrey: She has been bred from ordinary stock, that has given her that conformation and has been encouraged by men who do not understand breeding properly and maintaining the size and retaining the characteristics of the breed in a great many instances.

Ex-Gov. Hoard: Is size an indication of dairy strength?

Prof. Humphrey: I believe it is.

Ex-Gov. Hoard: Then the bigger the cow, the better the cow.

Prof. Humphrey: Provided she has what we call the dairy tendency accompanying the size.

Ex-Gov. Hoard: Is the 1500-pound Jersey better than the 900-pound?

Prof. Humphrey: I believe she would be if the dairy tendency were the same. I believe it would be better.

Ex-Gov. Hoard: Is that beefy Jersey up there (referring to

charts exhibited by Prof. Beach) on the chart better than this one?

Prof. Humphrey: I will answer that later, I am a student.

Mr. Taylor: What per cent of the Jerseys coming under your observation have been over developed, that is, have been fed beyond their limit of production; in other words, Nature built them to perform to a certain limit. Now, what per cent of them have ever reached that limit, their born limit of production?

Prof. Humphrey: Very few of them.

Mr. Taylor: If they have not been fed only a very few of them. Is a small cow an underling because of light feeding?

Prof. Humphrey: I would say that a great many of our Jerseys are that way.

Mr. Taylor: Then, is it not an unfortunate thing that she has met with the average dairyman and not the educated dairyman? Isn't it a fact that a Jersey bred animal will deteriorate faster than any other pure bred animal, from your observation, from the fact of the higher standard that they have to fall from?

Prof. Humphrey: I think it would be due to the fact, if they fell in our estimation, to the lack of greater strength and vigor than a great many possess.

Ex-Gov. Hoard: I am not satisfied exactly with your answer to my question as to size as an indication of vigor. The snow bird can out-vigor any animal on earth.

Prof. Humphrey: But I believe it is necessary to have size in order to have capacity to make an animal respond in the most economical manner.

Ex-Gov. Hoard: Matilda IV made over 900 pounds of butter in one year, and that was more than she weighed.

Prof. Humphrey: There are exceptions, of course. There are cases of small forms that have made wonderful products.

Ex-Gov. Hoard: They were cows of great vigor.

Prof. Humphrey: Yes, that is true; but the average in my estimation and from my observations would lead me to believe that the average number of cows of that size, provided they had constitution and vigor, would fall short in their average production from what would be expected in a class of animals that averaged larger in size.

A Member: Do you believe that there was ever a cow born

and fed so as to reach the limit of her capacity from the time she commenced until she quit.

Prof. Humphrey: There never was; we don't know enough about feeding to do that.

Secy. Burchard: I object to that answer a little. It is predicated on ignorance. You don't know whether certain cows have not been brought up to the very maximum of their capacity.

Mr. Goodrich: I want to say something about this size question, as an indication of profitableness. A few years ago the Secretary of the Dairymen's Association gave me for the subject on which to write a paper, "The Cow That Pays the Best for Her Feed." That is the cow we all want. I took the World's Fair record and a good many others, but that in particular. I took each breed, divided them into three classes, the largest, medium sized and the smallest, each breed, the Jerseys, the Guernseys and the Shorthorns in the same way, and in every instance the medium sized cow, I mean the medium size for her breed, paid the best for her feed. You take and divide them up in that way and you will find it is not the big cow nor the little cow, but the medium sized cow, just the same as the medium sized man, about like me.

Prof. Humphrey: I believe every animal is possessed of a dual tendency to a certain degree.

Ex-Gov. Hoard: Did any man on earth ever develop a specific breed of cattle that was bred for dual purposes?

Prof. Humphrey: I said to a limited extent.

Ex-Gov. Hoard: Did he ever develop that kind of a breed? Or didn't he have to breed for a specific purpose?

Prof. Humphrey: Some animals, in their natural development to a certain extent will develop to give a certain amount of milk, and to a certain extent they will develop and carry a certain amount of flesh.

Ex-Gov. Hoard: You do not answer me. Was the Jersey breed of cattle developed as Jerseys by breeding for a dual purpose?

Prof. Humphrey: No.

Ex-Gov. Hoard: Was Cruickshanks' Shorthorn developed by breeding for a dual purpose?

Prof. Humphrey: No.

Mr. Rietbrock: Do you mean that if a Jersey cow shows a disposition to lay on flesh, that is, one individual does that, while another does not show that tendency, that shows a dairy tendency?

Prof. Humphrey: That is true.

Mr. Rietbrock: Now, in the one that shows the disposition to lay on flesh, you say she has two purposes. I think that every cow has a dual purpose, even the most scrawny Jersey or a Guernsey, and that flesh, as far as it goes, is good to eat, but it is not as desirable flesh nor is it as profitable flesh to produce as that of a beef breed, but it is dual purpose, and that is the way I understand the professor.

Prof. Humphrey: It is dual purpose. You understand, Governor Hoard, my statement that I believe every animal is possessed of a dual tendency. You may consider that a dual purpose to a certain degree. Now, one of these tendencies I believe, usually will predominate, and feeding, after the heifer has freshened, is one of the best methods of revealing what the tendency is going to be.

Ex-Gov. Hoard: Which one should I as a dairyman breed for?

Prof. Humphrey: The dairy tendency, of course.

Ex-Gov. Hoard: Then cut out the other. You state there near the close of your paper, feed to develop the dairy tendency in a calf. That was your idea, wasn't it?

Prof. Humphrey: To feed to develop the natural growth of the calf.

Ex-Gov. Hoard: What about the temperament and tendency of the animal? Has that anything to do with the way you feed?

Prof. Humphrey: In my estimation, I believe that any class of feeds which tends to a natural growth, a maximum growth, will develop a calf that at the time of maturity will be suitable for a dairy animal or suitable for a beef animal, but the determining factor will be that inborn, inherent tendency which determines whether that animal is going to develop from that time into a strong dairy cow or a strong beef cow.

Ex-Gov. Hoard: But is it possible then for you to so feed as to divert the inborn tendency of this animal to a butter development?

Prof. Humphrey: Only as I withhold the feed and weaken

the strength and constitution of the animal to become a vigorous working animal as the inherent tendency would determine.

The Chairman: Two or three times you have used the expression "at maturity."

Mrs. Howie: Isn't it possible to overfeed a calf?

Prof. Humphrey: I would say only in the sense that we feed so much one day that the animal is off feed for the three following days.

Ex-Gov. Hoard: Did you ever make any experiments along this line?

Prof. Humphrey: That is one of the points that I must admit that I have gained these ideas from observation more than I have from work that I have actually done myself. I know of herds where dairy calves had been grown, and they have been given those feeds that developed a maximum growth, and when they reached two years or three years of age, they were more what we would term beef animals perhaps than dairy. Now, if the inherent dairy tendency is in those animals, they will commence after they have freshened, and as they gradually grow older they develop into strong dairy cows that, in type, are as good dairy cows as you can ask for.

Ex-Gov. Hoard: Did that one on the chart do so?

Prof. Humphrey: If she didn't, it was owing to the fact that she did not have the dairy tendency strong enough to make here that kind.

Ex-Gov. Hoard: But she was equally as well bred along the lines of dairy tendency as that other one. Whence the difference?

Prof. Humphrey: We can't explain that. We know that we are disappointed a great many times in the results of breeding.

Mrs. Howie: Isn't it possible to overfeed a calf so that it will never reach that age, that it may die in a few weeks, from overfeeding?

Ex-Gov. Hoard: Sure.

Mrs. Howie: It is a very risky thing in my experience to overfeed a calf. In the first place the calf's stomach is very small and tender, and if we let it measure its own ration, we would surely bring on digestive troubles.

Prof. Humphrey: I hope you understand the statement that I make, that a calf is never overfed only in the sense of what we term "overloading" so that the digestive organs are put out of condition.

Ex-Gov. Hoard: I had a high grade Jersey cow that gave me three heifer calves in succession. The first one I fed to develop her dairy qualities; the second I fed on fattening food steadily until she was eighteen months, and the third I handled as I did the first. The first and the third proved to be first class dairy cows, and the second one was absolutely spoiled and never amounted to ten cents.

Prof. Humphrey: Were you perfectly satisfied that it was the system of feeding that you practiced in the development of the calf that caused her to prove a failure?

Ex-Gov. Hoard: I am giving you the exact facts; the first and third were successes and the second was a failure.

Prof. Humphrey: I would agree with you that in the case of those three animals that would go to indicate that your system of feeding—

Ex-Gov. Hoard: Had spoiled the animal in one case.

Prof. Humphrey: Had spoiled the animal.

Ex-Gov. Hoard: That is what it did, and I did it on purpose, to see whether I could spoil it or not.

Mr. Goodrich: Would you feed a heifer calf that you wanted to rear for a dairy cow just the same as you would a steer—that you wanted to raise for beef? Would you feed them just alike when you were growing and developing them?

Prof. Humphrey: I presume you are referring now to the general practice of allowing our beef animals to suckle their dams and come up in that manner?

Mr. Goodrich: Yes, and then feed them grain, corn?

Prof. Humphrey: I would not recommend that, it is not the proper manner of raising a calf.

Mrs. Howie: Wouldn't it be wiser to measure the milk that calf was given, and wouldn't you use a good deal of judgment in feeding grain if you were developing this animal? You surely would not force unnecessary growth, but would you allow it to have grain after it was eight or ten months old?

Prof. Humphrey: I would commence feeding grain at ten days old.

Mrs. Howie: Then how long would you keep that up?

Prof. Humphrey: Until the animal had reached the stage of maturity.

The Chairman: Suppose you fed this animal grain and its appetite was satisfied on those heavy concentrates, do you think it would eat sufficient roughage to develop its barrel as you would wish to have it?

Prof. Humphrey: I don't believe any animal could be successfully developed by depending upon concentrates alone, whether we are developing that animal for a dairy animal or for a beef animal.

Mrs. Howie: Would it be wise to allow that animal to measure its own allowance?

Prof. Humphrey: Because in a great many instances, where you commence feeding concentrates to an animal, that is, where the animals are allowed to run with their mothers, brought up according to nature's laws, when a man begins to feed the calf, he must be very careful in his feeding, that he does not satisfy the appetite to the extent that the animal overeats, and thus deranges the digestive organs.

Mrs. Howie: It is quite necessary that one should understand the limit of the animal's capacity.

Prof. Humphrey: Yes, and that calf must have the closest observation and carefulest attention, which I have said was necessary in making that growth.

Ex-Gov. Hoard: Then you do not believe in the idea of specific dairy development through feed?

Prof. Humphrey: No, sir.

Ex-Gov. Hoard: Or specific beef development through feed?

Prof. Humphrey: No, sir.

Ex-Gov. Hoard: You consider that one is equivalent to the other, and that by the same process you develop one the same as you do the other.

Prof. Humphrey: The question of breeding and selection must come in there with the feeding, as Mr. Gillett says, the matter of breeding determines everything—no, I wouldn't say everything, but the matter of breeding has a great deal to do in giving the animal that tendency that is going to result in the animal's usefulness.

Ex-Gov. Hoard: Would you feed a dairy cow for the development of milk as you would a steer for the development of fat?

Prof. Humphrey: It depends upon the individuality of that cow.

Ex-Gov. Hoard: But would you put up a ration for a steer the same as you would for that cow?

Prof. Humphrey: It would depend upon the cow, I couldn't say. There are some cows that want the ration that would be suitable for the best steer that you could feed and finish off. Our live stock exhibits show that. I have seen cases where a cow would demand corn meal in great quantities in order to make her maximum production, to encourage that dairy tendency which she possesses.

Mrs. Howie: Isn't it possible to overfeed a cow for production, and to thereby lessen her production?

Prof. Humphrey: Yes, it is, but I can't tell you what the limit is.

Mrs. Howie: Well, we must find out how to limit ourselves if we are feeding cows. Now, don't you think it is a very nice way to have an average ration and then if you suspect your cow may go beyond that average ration, you add a little more meal until she begins to drop off and then cut it off and get her up to her limit and hold her there?

Prof. Humphrey: That is the plan we are following in our university herd. I don't know that I brought that out in reading my paper. Every individual in our herd is carefully considered once a week, as to what she is producing and as to what she is consuming. We find that some of our cows have a tendency to reduce in weight on certain grain rations. Their production may run along evenly, but they are making that product at the cost of flesh. Now, then, there is something wrong with that ration, providing the animal is in ordinary condition. If the animal is naturally fleshy, which we aim to have her at the time she calves, in good condition, she naturally will reduce somewhat in flesh, but after she gets down to a certain point we know that it is not the best thing for that cow to have her making her production at the cost of flesh, and being reduced in weight to the point that she is not strong enough physically to make a good production, and then the grain ration

must be increased. Maybe that increase will increase our flow of milk, and we cannot always determine just how much grain we want to feed to get a maximum production of milk, and maintain that constant weight. Mr. Gillett asked was there ever a cow that was fed just right for making a maximum production, and I say no, for the reason that it is not possible for us to put grain before the animal that would encourage the greatest amount of production and at the same time the greatest economy of production.

Some of these Jersey cows that were over at St. Louis at the exposition, some of the Holsteins and the Shorthorns,—I have reason to believe that there was a great amount of grain fed which, in many instances, was wasted. It was not economy, and consequently not successful feeding. It is hard for us to determine, but by the use of systematic feeding, careful observation as to the condition of the cow and as to the results of her production, it is possible for us to do a great deal better and be much more successful than we could hope to be if we are feeding in a haphazard manner and feeding regardless of the condition of our cows and regardless of our production.

Prof. Beach: The question of size was raised here. I have with me a few figures with reference to the dairy capacity of two different classes of Jersey cows, twenty-eight weighing 850 pounds apiece and twenty-eight weighing 975, a difference of 125 pounds in live weight, and there was only a difference of 75 cents in net profit, so I do not believe that size cuts much figure in the profit from the cow.

Mr. Scribner: I do believe this one thing, that under-feeding has a tendency to reduce constitution, and when we decrease constitution, we are going to hurt that dairy tendency to make butter. I believe we can put on flesh with the right kind of feed, and it doesn't hurt anything, but I would not want to put it on with the kind of feed we give a steer. If a heifer does lay on flesh at two years, I don't care. If she has the right tendency she will come into form without any trouble at all, if she has the milk function. If an animal is ever going to build up a constitution in the world it is going to do it when it is young. The first year is the important year—and the second year is just as important, and so right along.

Mr. Gillett: There was in our own herd a case of a cow that will probably go down in history, a Holstein-Friesian. I refer to Johanna Rue. This cow was reared by us and showed a wonderful development and wonderful producing capacity to the time when she was eleven years of age, when she aborted. In all the stages of her development, she was a perfect model of a dairy cow, a strong dairy cow. As I say, she aborted at eleven years and we did not succeed in getting another calf from her until she was fourteen years old. At that time she had a wonderful amount of superfluous flesh. If Governor Hoard had seen her the day before she freshened at fourteen years old, he would have said that cow was not worth a snap, because she was a perfect beef animal. But notwithstanding that fact, at fourteen years of age, after getting onto her feet from milk fever, she milked up to 75 pounds a day, and three months from that time she was right back to her old form, as typical a dairy cow as you ever saw. Another point in her case, as an illustration of how feed may influence form,—and function is not sometimes so much dependent on form,—I was going over my books the other day and among the progeny of this cow I noticed that we had four daughters that are now matured. Those four daughters have reached an average yearly production of over 16,000 pounds per cow and over 500 pounds of butter fat, and her two-year-old daughter, which freshened last September and which she produced when she was a beef animal, from last September up to this time, has given over 5,000 pounds as a two-year-old, and promises to excel them all. It seems to us that if you let them develop along that you may develop a form which very often is misleading.

Mr. Taylor: Supposing this cow had aborted when she was five years old or four years old and had gone dry for three or four years and taken on this great abundance of flesh, before she was fully developed. What would you expect she would do then?

Mr. Gillett: I believe that cow was born with that latent power, and that power would assert itself at one time or another in her lifetime.

Ex-Gov. Hoard: Bro. Gillett rather misspoke himself, I

think. He spoke about function being dependent on form. Function is never dependent on form.

Mr. Gillett: Not always.

Ex-Gov. Hoard: Never. Form indicates function. The bottom proposition is temperament or tendency, and function is dependent on that, and then form is dependent on function; so when we would indicate what function and temperament are we trace back the road. Starting with form, we indicate what function is, and function indicates what temperament is, and we breed for temperament in order to decide function and to produce form.

Mr. Jones: Are we to believe then that at any stage in the growth, whether fourteen or five years, or two or six months, that we do not endanger the future possibilities of a heifer calf for dairy purposes by any kind of feeding or laying on of flesh? Is that the conclusion we are to arrive at from all this wisdom that has been spread out before us today?

Prof. Humphrey: My belief is that if the calf, in the natural development from the feed that has been given, develops a considerable amount of flesh, that is, that it will give it that rounded appearance, perhaps beefy appearance, if that is combined with an inherent tendency that leads toward the direction of dairy production, that will have no influence whatever, or no harm will result from that kind of feeding.

The Chairman: Now, let us get a little consensus of opinion on this subject. Let Mr. Jones ask his question again.

Mr. Jones: I have been reading dairy papers and I have been attending Dairymen's Associations and Farm Institutes for a great many years, and keeping my eyes open all the time and trying to put something of what I hear into practice, and I have understood that I might endanger the dairy tendency of my heifers according to the way I raise them, and feed them. I have been taught that certain methods of feeding might endanger and divert their natural tendency toward dairy purposes by injudicious and unwise feeding. Now, as I understand from what has been said here today, am I to believe that there is no danger in this respect, that we can put on a great deal of flesh at any time, from the time the calf is born until it is matured, or until it is fourteen years old, without any danger whatever to the tendency of that calf.

The Chairman: I think that question was fully understood and answered by Prof. Humphrey. Now Mr. Gillett.

Mr. Gillett: I want to say this, first, I consider that every animal at its birth is destined to become a certain size at maturity; I believe that the sooner we judiciously reach that mature growth, the sooner will we realize a more economical utilization of the feed that we feed to that dairy cow. Now, if an animal does not get its growth until it is six years old, the feed that we commence to feed that animal for the purpose of producing milk is part of it used to make up that growth. Whereas, if that animal gets its growth at three years old, and begins to turn the feed that you use into milk earlier, I think the earlier development and growth is more economical. I do not believe that it is possible to get too much growth, providing you do it with the right kind of material; and what I would consider the right kind of food material is bone and muscle producing foods, not heating foods and not too wide a ration, too much carbohydrates.

Ex-Gov. Hoard: Mr. Bates warned the beef men of England that they were developing Shorthorns beyond an economical size. He said, "Gentlemen, you are developing Shorthorns to a size that will require too much food to maintain bodily support, and you cannot economically produce the flesh you want nor the finish you want on such a size animal." May it not be just as true of the dairy cow as of the beef?

Mr. Gillett: I think this hypothesis is wrong. I am going to say right here that I believe size with a certain degree of refinement is a desirable characteristic of a dairy cow, and I am going to take as an illustration, two engines, the power of one is ten horse power, and the other is fifteen horse power. The mechanical construction of those engines makes it possible for the fifteen horse power engine to exert one-third more energy than the ten horse power engine. Now, gentlemen, if we can breed the horns off of cattle, which we have been able to do, we can breed that increased energy in the dairy cows of the future.

Ex-Gov. Hoard: But you are comparing things that differ.

Mr. Gillett: I am not. The principle is the same theoretically. I say, if you have a cow, which at the weight of 1,000 pounds is supplying you so much milk producing function, if

you have that same power proportionately in a 1,500-pound animal, it is a desirable characteristic in that animal.

Ex-Gov. Hoard: Do you maintain that the milk producing power of a cow is the same as the power producing power of an engine? I say it is different.

Mr. Gillett: In the case of an engine, we have an energy which is figured out mechanically. In the power of the cow, we cannot figure mechanically, or mathematically. I made the statement, and I stick to it, that I do not believe it is possible to do harm, providing the proper food it fed.

The Chairman: You speak of the amount of growth. The gentleman asked about flesh.

Mr. Gillett: I don't think he hurts it by fattening it, providing he fattens it with the proper kind of food.

The Chairman: Now, Mrs. Howie.

Mrs. Howie: I have been under the impression for several years that we could overfeed an animal, and that if you kept it growing naturally, kept it as healthy as you could and limited its food with your judgment, you could easily discern if it went back at all. You can keep the food before it and then take it away at a suitable time, give it a large amount of roughage and plenty of water, and you will develop an animal that will be a credit to your dairy.

The Chairman: You are not answering the question any more than Mr. Gillett. The question is, from calfhood to motherhood does it hurt that animal to make it fat?

Mrs. Howie: I believe it does. I believe that I ruined several fine heifer calves by replacing the fat in the skim milk by too much oil meal. Now, as to the size of the animal. If Mr. Gillett were selecting a jewel for his shirt front would he take a plate glass window or would he take a little gem of greatest quality?

The Chairman: Now, Mr. Everett, and I am going to pin Mr. Everett right down to answering this question.

Mr. Everett: You are not going to do anything of the kind. I haven't said a thing this afternoon, and I am going to hold you responsible for letting this discussion run away with itself.

The idea has gone out here that the dairy heifer calf may be allowed to suck its mother six months or a year on five per cent milk and make just as good a dairy cow as

they can on skim milk. Another idea has been allowed to stand out here, that you can feed a dairy calf anything and make a good cow of it, and my experience as a dairyman refutes the proposition. Mr. Scribner helped the matter a little, but not quite enough. Mr. Gillett did better when he classified the feeds and said "not if you feed proper food." I do not want to feed a heifer calf intended for dairy purposes on foods that will make that calf fat. I wouldn't let that heifer calf suck its mother, because in that way I am educating that calf away from the dairy tendency toward meat production, and my experience convinces me I will spoil that calf in that way. I want to rear that calf on protein foods; make a good, strong, vigorous, healthy calf; but that calf has not and never will have any use for beef, so what is the use of feeding foods that will encourage the beef tendency?

The Chairman: That is a good answer. Now, Mr. Goodrich.

Mr. Goodrich: To get right at the answer I believe if you should let the best bred heifer calf in the world run with its mother and have its mother's full milk until it is six months old, give it some corn and make it very excessively fat and keep it that way till it freshens at two years old, it would not be worth half as much as though it had been fed as Mrs. Howie would feed it, because you have developed a beef tendency that would always stick to it. It would give a good mess of milk perhaps for a while, but when you fed it up to keep it up to the top of its milk production, it would begin to pile on fat instead. There is a physiological reason for this that I could give, but I guess I won't.

The Chairman: I am going to call for just one more answer to this question. Mr. Taylor, answer this same question.

Mr. Taylor: I believe that we can so feed a young dairy bred calf in its early growth, as to ruin it as a dairy animal. I do believe that that only occurs once in a great while, and is not liable to occur after it gets into milk; that there are more cows underfed than there are overfed, more horses overfed than underfed, and all men overfed.

My brother, keep on reading the dairy papers and believe what you want of them. Theory and practice were married

a great many years ago and no man is fool enough to print anything over his signature in the way of a theory that does not comport with the best practitioners in that line. And no man is fool enough to do any dairy business in Wisconsin that does not accord with theory. Now, read all the theory you can and put all that into practice. I believe fully that if this Holstein cow had aborted with her first calf, or had aborted with her **second calf**, that she, with all her strong dairy tendency, would have been ruined. If she had aborted with her third calf, her fifth or sixth, and had not conceived again until her ninth year, she would have been diverted from the dairy tendency to a beef tendency; but she was fed and fully grown and fully developed to her eleventh year before this occurred, and her tendency was fixed and you could not divert her. At the same time I want to say that it grieves me to see a pure bred Guernsey calf or a Jersey calf with a small amount of flesh on its bones and its carcass, calculated by nature to turn farm products into dairy food economically, I am sorry to see it underfed and starved and then have the professor observe that they are a degenerate, weak race. In such cases, it is the lack of food, it is not the lack of breeding. If you have calves, look after them and see that they are so fed that every one of them grows when they begin to grow, and they will do it if you are giving them the right kind of food. I think we have misunderstood the professor here, because we have presumed that that steer fed for beef and fat has been properly and correctly fed. I want to say that he has not been fed right, that the same feed that would grow and develop a dairy animal before it comes into milk is a proper ration for a growing steer. The professor intended to give you a growing developing ration, and both the heifer and the steer will grow and develop on the same ration until you reach a certain limit, and then you trade off and you give the heifer a dairy ration and she makes a splendid dairy cow and you give the steer a fattening ration and he will live up to that about ninety days and then he will go back.

Ex-Gov. Hoard: The feeding for lean and the feeding for fat is a very good illustration of the effect on the bodily growth.

The Chairman: I am going to change my ruling and call upon Governor Hoard. I wish I might call on Mr. Rietbrock

and Mr. Jacobs and Mr. Scribner and a lot of others, but I am going to limit it to the governor.

Ex-Gov. Hoard: I set out to spoil this heifer I told you about, and I want to tell you how I spoiled her. You remember that I told you that these three successive heifers from the one mother were handled with the idea of seeing whether the handling, the feed, etc., would have anything to do with the future character of these heifers. The first one I fed on skim milk and oats; the second one, which I spoiled, I fed on corn meal. I did all I could to lower the protoplasmic growth of that heifer and fill her up full of carbon. Corn meal is almost pure carbon. I kept pushing this heifer right along and she was hog-fat when she was six months old. She kept hog fat until she was three years old and she was a dead failure as a cow. I intended she should be, I hoped she would be, but I wanted to be sure. The first heifer I fed in the way I told you, and she proved to be a very nice cow, and the third one I fed in the same way as the first and she proved to be a nice cow. These things, with observation, have convinced me that there is such a thing as judicious feeding and that there is such a thing as dairy feeding for the development of dairy cows. Bees know the value of feeding. They will take a certain food and develop the drone, they will take another food and develop the neuter, they will take another kind of food and develop the queen.

Mr. Emery: I want to speak just a moment on this question, and I will answer directly the first question, that I am fully of the opinion that this calf can be seriously injured as a dairy cow by the method of feeding. Whether it is a man or a horse or a dog or a cow that comes into the world, they all come with certain inherited possibilities. We call them powers or tendencies. They are simple possibilities, and these possibilities are brought out by environment and these are the two comprehensive forces that bring every individuality to its maturity, and the great work is the establishment of habit. Now, I will undertake to defend the proposition before this audience that the great work of education is in developing and fixing habit. Now, when we are feeding that calf, we are fixing a muscular habit, we are fixing a habit in that calf's constitution, and if we shall so feed it as to fix the habit of laying on fat, there is

that tendency, there is that habit, and it goes on as all other habits go on, and it weakens the dairy tendency. The laying on of flesh on the outside is not a dairy tendency, it is not a dairy habit. It is the converse of that, and that habit created is like any other habit, it comes in to hinder or weaken different and better tendencies. We want to fix the dairy habit in this calf, and I believe we fix that dairy habit by the way it appropriates its food and gives it energy to do the specific work. I believe this is the fundamental thought in dairying. The teaching and the practice of the dairymen in Wisconsin is all wrong, unless this is true, and we have got to begin and learn things all over again.

Mr. Rietbrock: Governor Hoard has told us that he spoiled his heifer calf by his method of feeding. I want to ask him the question if he had fed the same ration to steers of the same age what would have been the effect upon those steers?

Ex-Gov. Hoard: I don't know.

Mr. Rietbrock: Well, I do. It would have spoiled a steer just the same.

The Chairman: I think it quite likely that in listening to this discussion some of the audience have gained an idea that there is a good deal more divergence of opinion than there really is. It has been my privilege many times to visit Governor Hoard's calf barn and also the calf barn at the Experiment Station, and the calves look just alike.

Ex-Gov. Hoard: I do not want that anyone shall be misled in their breeding and handling and developing judgment.

Secy. Burchard: I think I can perhaps say a word that will tend to harmonize what seems to be a conflict of opinions here. If I was to criticise what Professor Humphrey has said in regard to feeding the calf, it would be to the effect that he did not specify quite enough. I believe every calf, in a way, should be fed up to the limit of its capacity—not always to the limit of its appetite, because it may overfeed if left to its own judgment. Now, to do that, the careful feeder should select those feeds with a view to developing first, in my judgment, a healthy growth, and of course in doing that we must not forget, as Mrs. Howie has said, that the calf has a weak stomach and cannot digest concentrated food, nor what we ordinarily call roughage, at the very first, though in a few days it will com-

mence to nibble at some hay, if it can get it. We must be wise, feed it to stimulate growth, but feed also for the purposes of developing a digestive tract, and there is where the roughage comes in, and in that way of feeding the calf, I do not believe you will be very likely to get on too much fat. Experiments have shown that calves or steers can be developed up to an unnatural growth early, and unnatural development of fat as distinguished from muscular tissue, from lean meat, and I think that to be very objectionable in raising a dairy heifer or a dairy bull,—for I believe that the dairy bull should be brought up the same as the dairy heifer.

Prof. Humphrey: Mr. President and Members of the Association, I know you will realize that I have the failing of getting excited. I presume that I have made statements here that have not been clear to you, and I feel that our discussion is owing to the fact that there is not a clear understanding between us as to what we consider the natural muscular development and growth on the part of the young animal. It is interesting for every person to study how meats are developed in the different forms of animals. Now, the dairy cow has just as many muscles as the beef cow, so far as muscular development is concerned; there are the same number of muscles in her body that there are in the beef animal, and in considering growth we must consider the condition of those muscles. Now, fat and flesh are two different things. Fat never made an animal strong. If you were feeding a calf with the idea of just developing fat, that animal wouldn't do for beef, for it isn't fat that you want; it is meat, muscle mixed with an amount of fat that makes that meat juicy and tender. The development of muscular strength in the dairy calf, as we are growing it to maturity, is no detriment whatever to the development of the power of the animal to become a strong dairy animal; that is what I believe. We do not understand the difference between fat and flesh. Even with Poland China pigs, you feed a very fattening ration, you tend to develop a short-bodied, small, round, dumpy pig that hasn't growth enough to make it a desirable pig. You can spoil that pig in its development by the kind of feed that you feed it, and you can spoil a heifer.

Ex-Gov. Hoard: That is what I did exactly.

Prof. Humphrey: But in proper development, I say you

could not overfeed that animal with the class of food that would develop its proper growth, which would not be a fat growth but a natural growth.

Ex-Gov. Hoard: That is all right.

Prof. Humphrey: You have seen beef animals put onto the market that were not raised by new milk alone, and perhaps they were equally as good, when finished, as some of those that grew up at the side of their dams. We have some steers in our herd today at the University farm that as yearlings were as thin and scrawny—I won't say scrawny,—but as thin in natural development as any dairy heifer would be. That is, they had a peculiar conformation different to the forms of some of our dairy animals, but though they were lean they were strong. Now, they had to have feeding capacity, and those steers with that beef tendency have developed into perfect beef animals, when, if they possessed a strong dairy tendency that would not have been possible.

I am not going to say anything further, I hope that we understand each other now, and it is a matter for you to decide what will be the best ration for developing that perfect growth. I cannot tell you, because if I fixed a ration for you, perhaps the tendency of that animal might go back and fail in proper development. You must study this thing, give it your close attention and decide for yourself.

Mr. Scribner: I believe that the average farmer, all over the country, the average dairyman, underfeeds his calves and that he thereby hurts their constitution, so that when they are grown up they are not able to digest and assimilate their food. So I say we better encourage them to more liberal feeding and the right kind of feeding. We do not pretend to feed our heifers on corn meal. They get a little ensilage, the leafy part, but they have bran and oats and hay, and if they put on a little flesh with that kind of feeding, I have no objection to it. That is where I stand.

Mr. Everett: And that is pretty near the whole thing.

Mr. Jacobs: I stand upon the same ground that Mr. Scribner has taken. I do believe that it is necessary to impress upon the farmers in this country and in this state the necessity of feeding this calf liberally and feeding it all the time. We have learned from the sheepmen that if a sheep has a sick time, or is

short of feed, there is a place comes in the wool, a weak place in the fabric corresponding to that sickness. Now, this dairy calf, perhaps you have been caring for it and feeding it reasonably well up to about five or six months, and then you consider this calf can get along without milk, and you turn it out and you don't pay much attention to it, and it runs and has to take pot luck with the rest of the herd, or perhaps the flies are getting bad; and I tell you that calf will never get over that experience. You must keep feeding it, it must not be allowed to run down for one minute; it must be kept growing and thriving all the time.

Mr. Everett: I believe that the President of this Association is one of the leading dairymen of this state, and I would like to know what his opinion is on this subject.

The Chairman: I believe I have as pronounced opinions as any of the rest of you, and yet I agree with the rest of you. After all, there is very little difference of opinion between us. The professor explains that when he says flesh he means a large development of the muscular tissue. I have come myself to believe in a greater development, a more rapid development of the dairy cow. We have been troubled quite considerably with contagious calf cholera, and for that reason we have not been able to crowd our calves as hard as we have done in former years, but I do intend to so feed them that they may grow rapidly every day of their lives. I don't want them fat, but I want them to make just as large muscular growth as possible and when the time comes for them to freshen, I do not mind if they at that time become somewhat fleshy. They are never fed fattening food, by that I mean grain food. They do have silage and clover hay for roughage. I never have had a heifer properly bred but what would milk that flesh off at once. My own experience shows me that that class of heifers, grown in that manner, make by far the best cows in my herd.

Mr. Emery: Don't you think the so-called calf cholera is due to overfeeding?

The Chairman: No, sir, I know it has not anything to do with it. It is a contagious disease.

Mr. Goodrich: I have known them to have calf cholera before they have eaten at all.

Mr. Everett: It strikes me that our point is to teach the

Marathon county farmer and every other farmer how to properly rear good calves for dairy purposes, and the matter is simple. I happen to be an old calf breeder. I kept on my farm a herd of grade Jerseys, and a herd of Shorthorns of the Cruickshank type. The grade Jerseys were raised on skim milk and I would rather have a skim milk calf for dairy purposes than to have a whole milk dairy calf. Mr. Scribner said he would like his heifer calves to have a little ensilage, but he is particular that it should be the leaf portion. I let my Shorthorn calves have all the ensilage they wanted, but never the heifer dairy calves, just a little of the leafy part of the ensilage to add a little succulence to the ration. Now, I suppose I will hurt Mrs. Howie's feelings when I say that I always took the calf away from its mother immediately. It was always my part to take the calf away from its mother at once. Of course, I mean I did not let the calf suckle its mother. I did not separate the two entirely, but placed the calf at the cow's head and would sit down myself and milk the cow instead of letting the calf do the milking, and not one will ever distinguish between the two calves; that is, the one that is milking and the one that she is licking. Then the next thing is to take a little of that whole milk and teach the calf to drink it. I want to encourage these Marathon county farmers to raise calves, because they have a splendid country here to do it in.

A Member: I want to ask some of you dairymen a question about breeding. A neighbor of mine has had three kinds of bulls in the last five or six years. What do you think is the result?

Mr. Everett: He has got hash. Choose the breed that you like best and stick to that breed for a term of years, and whenever you buy a sire buy one of the same breed, and breed in line as nearly as you can. I want to say about teaching a calf to drink, we must have patience, remember when some of you were boys you didn't know half as much as the calf, and don't get mad at it and slap it because it doesn't eat the first time. I never had any trouble teaching the little calf to suck my fingers. Feed them this milk all the time and in small quantities, three or four times a day. The whole proposition is butter fat; that is what we are after. The cow isn't worth anything that doesn't give lots of butter fat. You can't afford to feed

this calf butter fat, so you take the butter fat out of the milk and send it to the creamery and after a little while you begin to add skim milk to this whole milk, so that when the calf is ten days old you have ceased feeding mother's full milk and are feeding skim milk. You must add something to that skim milk, and for this I use oil meal jelly. I pour boiling hot water over a quart or two of oil meal, and in a little while it becomes oil meal jelly. You add a tablespoonful of this jelly to the skim milk, and it will dissolve, it is better than butter fat for the calf. About the same time I teach this calf to eat whole oats. Take a handful of the oats and smear them on the calf's nose and the oats will stick there and they will begin to eat and there is nothing better for them. Raise a little clover hay and always keep it where the calves will help themselves and you have a good combination of feed. After they begin to eat the oats, you can leave the jelly out of the skim milk, because there is enough fat in the oats and in the clover hay. Give them a little bit of leafy ensilage now and then. My spring calves I keep in the barn all summer long and all the next winter. Don't turn spring calves out to fight flies, for the sake of getting a little green grass which will probably give them scours. Keep them in the barn all summer and feed them the same as you did in the winter and you have got a good calf at the end of six months.

SECRETARY'S ANNUAL REPORT.

To the President and Members of the Wisconsin Dairymen's Association: I have the honor to submit the following report for the past year.

The total expenses incurred since our last annual convention, which was held in Platteville last February, amount to \$3,378.49, and may be classified as follows:

Convention expenses	\$414.29
Convention premiums	196.40
Cheese instructor (Aderhold)	1,087.00
Creamery instructor (Corneliuson)	876.00
Swiss cheese instructor (Marty)	785.00
Swiss cheese expenses	19.80

Total \$3,378.49

In addition to the above the instructors collected from cheese factories and creameries \$313.50, which was applied directly on their per diem and did not pass into the treasury.

There is in the treasurer's hands at this date, if there are no errors in my account \$1,354.07, with which to pay the salary and expenses of the secretary \$303.27, the W. D. Hoard Co.'s bill for printing programs and other items \$26.10; the expenses and premiums of this convention, which may reach \$750 to \$800. This will leave a probable balance in his hands of about \$200, besides what may be collected for annual memberships at this convention.

We have had but three instructors in the field during the past year and the foregoing financial statement explains why more were not employed. There was no money available to pay them.

I believe these instructors have been doing better work than ever before, but when I look over the field and see how much ought to be done in this line, and how little it is possible to accomplish with the meager force at command I am well nigh discouraged. I had hoped that the present legislature would con-

sider this problem and do something towards putting Wisconsin in line with neighboring and competing states, but I see no indications of any disposition in that direction. Possibly a resolution on that subject expressing the views of this convention would not be amiss.

I trust it may not be considered presumptuous if I add a few words personal. I have performed the duties of Secretary of this Association for nearly eight years, much of the time at some sacrifice of that relief from labor which advancing years and a multiplication of other duties invite. But I have greatly enjoyed the work and have allowed myself to believe that it has resulted in some benefit to the dairy interests of Wisconsin. I realize that it is usually considered ungracious to decline what has not been tendered, but I have been the recipient of such favor from successive annual conventions of this association that it does not appear to me to be improper to request that my name may not be considered by your committee on nominations or by the convention when officers are to be elected for the ensuing year. My heart overflows with gratitude for the past, and I trust it may be practicable for me to meet with you in future conventions, relieved of the care and anxiety inseparable from official responsibility.

Respectfully,

GEO. W. BURCHARD,

Secretary.

On motion of Mr. Emery, duly seconded, the report was adopted.

Ex-Gov. Hoard offered the following motion:

"I move a special vote of thanks on the part of this Association to Secretary Burchard, for his faithful, earnest and zealous discharge of his duties, as Secretary of this Association.

Motion seconded and carried unanimously by a rising vote.

Adjourned till 10 o'clock next day.

FRIDAY MORNING SESSION.

February 10, 1905, 10 a. m.

The President in the chair.

THE CLOVER BELT AS IT WAS IN 1850.

Hon. John C. Clark.

Mr. President: I am very sorry that I am unable to be with you on this memorable occasion, as I would be glad to see many old friends and acquaintances of days gone by. Having been appointed as the Antiquary to tell you of the last sixty years' progress of Wisconsin grasses, my friend, Mr. Rosenberry, will read and tell you my views, recollections and knowledge which I trust will be of interest to all of you.

Friends and Fellow Citizens of Marathon County and Wisconsin: It was a great surprise to me that I should be invited to address a lot of farmers and dairymen on the subject of grass, clover and timothy, or any other subject unless it pertained to lumbering, from the forest to the mill, through the mill to the raft, the raft down the river over the wild Big Bull Falls, over the raging rapids of the Wisconsin, then on down its crooked and winding way, among the sand bars and shoals, to the Mississippi and a market for our lumber, which occupation and business I followed from 1845 to 1884, commencing as a cook in a shanty, and ending as a manufacturing lumberman.

These things might be told of with incidents that might be interesting as history, but would be useless on the cow question, but I will do what I can for the grass and the clover.

THE STRUGGLES OF THE EARLY PIONEERS TO GET INTO THE
WISCONSIN VALLEY.

This country was a dense and unsubdued forest from the place where Stevens Point is located to the shores of Lake

Superior on the north. To open up the country for the business of lumbering was no child's play, but was work for men of stalwart bodies and determination of mind. Such were the men who opened this vast expanse of territory.

When George Stevens started from Belvidere, Ill., with three ox teams, to come here in 1840, it was mostly prairie land to near Fort Winnebago; from there on to Stevens Point, were oak openings and sandy plains, with a trail made by the Indians to Point Bausee, where Whitney built the first lumber institution in the valley. Thereby Point Bausee became the basis of all migrations to the north. It was at the head of navigation, being at the foot of the long series of rapids on the river.

There the Menominee Indians would gather at times for their hunting and fishing expeditions. In 1848 there were over five hundred Indians, with Chief Oshkosh at their head, holding a pow-wow, or council, over the sale of their reservation to the government. Their lands extended from about Fort Winnebago to Big Bull Falls on the north, and from the Black river on the west, to the Fox river on the east. This region was covered with heavy forests. The wealth in the magnificent pine was as alluring to the pioneer, as ever the gold fields of California were in 1849. The question of how to get at it to make it marketable was the absorbing thought of all minds. Migratory pioneers are not generally the possessors of much, if any, ready money. All the wealth they possessed was stout hearts, strong muscles, and common sense, with physique enough to knock a bull down. Such were the men that first tackled this great forest.

With their means, it was out of the question to open roads to the several water powers where saw mills were to be erected, as there was no money to build them with, so log canoes were hewn out of the woods and supplies of every name and nature that were necessary for their sustenance were boated by the canoes in summer season, and the ice on the river furnished the road in winter, upon which supplies were fetched into the country. At this time, there was but one house between Madison and Fort Winnebago, and but two houses from the Fort to Point Bausee, which were kept by men who had Indian women for wives. The population in 1845 of the valley from Point

Bausee in the whole pinery was only three hundred, about all men, with about twelve or fifteen women.

The reputation given the country by the traders of the American Fur Company, was that the land was stony, sandy and barren, mountainous and marshy, cold and unhealthy and not fit for farming, or ever to live in by civilized people; and that was the impression of the lumbermen for many years. They thought that all the lands that would pay them to cultivate, were the islands in the river, and the bottom lands on the banks, which grew blue joint and red top grasses, where the hay used by the lumbermen was cut. They soon found that the high grounds would raise hay and potatoes, if nothing else.

When the logging roads were cut, to draw the saw logs to the river, horses as well as oxen were used. The horses manured the roads and in the spring timothy and clover would spring up as thick and straight and stout as it ever did in any meadow.

Here I would relate an incident that occurred in 1844.

Two yoke of oxen strayed away from home on the west side of the river. They had been gone several days, and two men, Martin Lynch and another, were sent to hunt them up. After the oxen had entered the forest a few miles, they lost their bearings and got bewildered and were lost. They were gone two weeks and had nothing to live on with them, but the luscious blue joint grass which kept them in good order and fat enough to butcher for beef. Lumbermen, as soon as the snow was gone in the spring, would turn the cattle out to get their own living, and in a month or so, they would be fat enough for prime beef. I relate this to show the fertility of the land in the growing of grasses.

But it took several years before the clearing of the hard wood ridge was tackled. The Marshall farm was about the first. Benjamin Single, Joe Briggs, Jos. Dessert, James Moore, Ben Barry, H. Pearson, Abraham Bradley, Ed. Armstrong and W. E. Maine cleared land on the hardwood ridges in the later forties, and the early fifties. After these men showed their success, many others followed. In 1855 the German immigration commenced and their number has increased ever since, especially since 1870, until nearly one-half of the country is German or of German descent. They are a good class of people; patient, industrious, frugal, honest and trusty. No more

can be said of any people. We have also a large class of Irish settlers, who are as good a class of people as any in Wisconsin. The Poles in the western part of the county, are good farmers, and home builders, but rather clannish, in their ways and living. All these people on the farms grow all kinds of crops. To enumerate them would take a farmer. A walk through our exhibition on fair day tells more for the glory and honor of the soil than can be done by any tongue or pen.

The county today with its lovely and beautiful Wausau, surpassing every other city in Wisconsin of its size, with its fine schools, churches, public library and dwellings is the pride of every citizen within its limits. In the country, wherever you go, you find growing villages with schools and churches. The farms you pass by have fine stables, homes and barns for horses, and the fields are well cultivated and beautiful to look upon. What a change in one short life, from a howling wilderness to a lovely, beautiful Eden, where peace and tranquility reign and everything is lovely.

THE CLOVER BELT AS IT IS IN 1905.

John F. Lamont.

My friend, Mr. Clark, has told you in an entertaining way of the clover belt before the white man knew that this could be developed into a profitable agricultural region. It is fit that I should take a little of your time in paying a tribute to the class of hardy pioneers represented here by Mr. Clark. They came to this section when only men of sterling character and tried worth could withstand the hardships incident to the development of this magnificent heritage, then so far removed from the comforts and prosperity of a developed civilization. All that we of this generation have today is due to their foresight, industry and persistence. They brought to this valley the present means of transportation and all the methods of developing our natural resources. Many of them sacrificed without pe-

cuniary gain, their health, their worldly comfort and their possibility of material wealth to give to us title to one of the most magnificent properties that the sun ever shone upon. All honor is due them and no man took a more important part and no name is better and more favorably known in the historical annals of this region than that of John C. Clark.

When I speak in this paper of the clover belt I have in mind all of that territory which lies between the valley of the Black river in Clark county on the west and the boundary line between Shawano and Marathon counties on the east; between Grand Rapids on the south and Medford and Merrill on the north. We learn from a survey of the soils made by Dr. Samuel Weidman that there are in general two great areas of different kinds of soils in this belt. They are named by him the "Colby Clay Loam" and the "Marathon Loam" the former covering about four-fifths of the territory described. The Colby Clay Loam is described as a heavy soil, uniform in texture and composition, and is a result of the glacial action of the Great Ice Age. It being in what geologists term the "Old Drift," there are no lakes, basins or swamps. The ground is well drained and gently rolling. Dr. Weidman tells us that this drift has been weathered to appropriate material for soils to a depth of from two to ten feet and that the surface is enriched by from six to ten inches with abundant decayed organic matter.

His further statement is that, "The deep weathering of these old drift formations forming the Colby clay soil makes them of especial value to agriculture. Similar soil conditions prevail here as upon the old drift formations which constitute the richest agricultural regions of Southern Iowa, Northern Missouri, and Northwestern Kansas. This Colby Clay covers an area of about twenty-three hundred square miles.

The Marathon Loam has many characteristics of the Colby Clay but it is a lighter clay soil. We find in the Marathon Loam a few boulders and some gravel. It is residual soil, derived almost entirely from the decomposition of granite, greenstone and other crystalline rock. It was covered with a heavy forest growth and has an exceedingly rich top soil.

In the narrow valley of the Wisconsin we have a sandy soil owing its origin to the accumulation of successive layers of

gravel, sand and silt deposited by the river floods during the glacial period. It has been described as being similar to the truck soils of Maryland, New Jersey and Long Island.

In connection with the soil of this region we must take into consideration the climate, if we are to discover the reason for the wonderful growth of clover. Again I quote from Dr. Weidman who made an extensive study of the clover belt. His theory is, "That the weather conditions of the area are modified appreciably by the two great lakes, Superior and Michigan, on the north and east. Neither of these lakes freezes over in winter and because of their large area, 32,000 and 22,400 square miles, it is evident that whenever winter winds come from their directions both their temperature and their humidity are increased. In like manner, during the summer months the lakes tend to make the air cooler whenever the winds come from their direction, for the body of Lake Superior rarely reaches a temperature higher than 46° F. and much the same conditions hold for Lake Michigan."

The average annual rainfall for ten years from 1892 to 1901 is given as 30.6 inches, and for the same period for the growing season from April to September is 21 inches. An extended season of drouth in this section has never been known. Dr. Weidman's final conclusion on the climatic conditions is as follows: "In the matter of a larger development along already well established lines of agriculture, such as dairying, climatic conditions are especially important. In the dairying industry a comparison of the climate of the northern counties with the southern counties of the state and with the dairying sections of the country shows this region to be especially favored. Throughout the growing season of the year, in the area here described, there is sufficient fall of rain to cause a continuous growth of nutritive grass for grazing purposes, and the climate is sufficiently cool to produce the best flavored milk, a highly important factor in making the best grade of butter and especially important in the production of the best flavored varieties of cheese."

I am now about ready to submit to your verdict the query that with a soil of this character and a climate that could not be bettered for the growth of forage crops have we not an ideal condition for the development of one of the greatest, if not the

greatest, dairy section of the country? Clover is listed as the greatest of all forage plants for the dairy cow, and here it grows not only abundantly but with a luxurious extravagance that is beyond the belief of any man who never gave this section close study. And what a wonderful plant it is! It gives you twice the return in fodder that timothy does and at the same time enriches and puts into the soil elements necessary to the growth of any kind of crop. While its top is giving forage, its roots are working overtime storing the nitrogen so necessary to the soil. No farmer who persistently and intelligently grew clover ever had a worn out soil.

To one who takes the matters I have outlined and present conditions into consideration it will seem strange that the farmers of this belt did not earlier turn their attention to dairying, but it must be remembered that until within the last decade the principal business of this section was lumbering and that we are comparatively new as an agricultural community. Not many years ago the lumber camps furnished markets for hay, pork and potatoes and the farmer clearing up the new farm grew that crop which quickly and surely brought him cash for his labor. With the exit of the lumberman came the entry of a new kind of farming and we were not long in learning that there was a great market away from home for the staple that we were in the best condition to produce. With this new knowledge has come a desire for improved stock and here and there throughout this territory has been built, almost in a day it would seem, many cheese and butter factories, until we have in every town a place for marketing the milk where it can be manufactured into cheese or butter. Fifteen years ago there was hardly a factory in this whole region. Fifteen years from now there will be a factory or a skimming station at every cross roads.

I have made some effort to get a systematic report from each town clerk in Marathon county as to the location of the creameries, cheese factories and skimming stations in the county and the map will give you some idea of how this industry has grown. The products of these factories go all over the United States. One butter factory near Edgar ships its entire output to Washington, D. C. Others have an established trade in other cities in the east. But little of the butter produced is

handled by the jobbers in Chicago. This does not seem to be as true of the cheese factories. Much of the cheese seems to be shipped under contract and the boxes are marked with the name of some large Chicago firm before leaving the Marathon county factory. So much faith have I in this territory that if I were the boss every package of cheese or butter shipped from this belt would be so labelled that every observer would know just where it came from.

There is a cheese factory near Colby that has earned a reputation all its own and so well is it known on the market that all the factories in that vicinity have taken advantage of its good name and any package marked "Colby Cheese" brings a ready sale and the top price. The Steinwand factory was established many years ago and was among the first that was put upon a paying basis in this section. I am informed that great care was taken in the manufacturing of its cheese from the start and today its whole output is handled by one of the largest grocery houses in Milwaukee and commands a price which is always above the market quotation.

But my time is up and I must hasten. To discuss the evolution of the small farm dairy into the co-operative creamery would be a waste of time. You doubtless know more about it than I do, and I presume our history in this respect is not essentially different from the history of the development of other dairy sections.

If I had the time I might tell you of the efforts made to get better stock into the country and the work of educating people to an appreciation of our possibilities, of the influence of our fair, and of our county agricultural school in this respect.

I will only say that the clover belt today, with its wealth of cleared farms, rich soil, excellent farmers and enthusiastic citizens is only a beginning. Its future is assured and it is destined to become the richest and best known agricultural section of this splendid state of Wisconsin. Go where you will, you cannot find a richer soil, a better climate nor a more industrious class of citizens, and some day, and that before we are much older, the farm property now on the market in the clover belt cannot be bought for love or money. Here no man will ever be lost in a blizzard, and no crop will ever die for want of water, the locust and the army worm will find sustenance further west.

This will be a land flowing with milk and honey, populated with a contented people richly endowed by nature with her greatest gifts, a heritage unrivalled, the pride of the Badger State.

DISCUSSION.

Mr. Rietbrock: Inasmuch as Mr. Lamont is our Superintendent of Schools and has been for ten years, he is the man of all men that can tell us something about this question of agricultural schools.

Mr. Lamont: During the past six or seven years throughout the state of Wisconsin there has been something of a movement toward infusing a knowledge of agriculture into the rural schools of the state. That movement was led by the state superintendents of the past twelve or sixteen years and reached its highest development, I think, about three or four years ago. We have done what we could. You remember that teachers some four or five years ago were required to pass an examination upon elementary agriculture. That had but little effect, because most of the teachers have had no opportunity of getting the preparation necessary, except in those counties that have county training schools where they have some facilities of that kind. But it is not practical, because we have not the tools with which to work. We have not the sentiment among the farmers themselves to have that introduced, but we have done all we could in that direction and the movement has grown from year to year, and I fully expect that within the next ten years we will have more and more of it.

The Chairman: Mr. Lamont spoke about the Colby club cheese factory. We have that on our table at home, and it is the best cheese we can get and we know where we can get it. What this factory has done in building up a reputation for itself, other factories in Marathon and adjoining counties might do.

Mr. Emery: The remarks that Mr. Lamont made in regard to getting statistics of the dairy products of the county appeals to me. Two years ago we undertook to provide a law

by which we could ascertain accurate statistics in dairy products, but the reports that have come in have been disappointing. The law required the assessors in the respective towns, cities and villages where factories are located to make reports as to the names of these factories, and the output of the factories. But few of the counties have given accurate statistics, while others are worse than worthless, and I deem it a great misfortune that we can secure no accurate statistics in this great dairy state. In Minnesota and Iowa they seem to have no trouble, the great state of New York has accurate statistics, but we, so far, have been unable to obtain them.

Mr. Curtin of Calumet county has introduced a bill in the legislature, requiring that all cheese factories in the state shall obtain a stencil from the Dairy and Food Commissioner, for which they are required to pay one dollar, and they are required to stencil the cheese manufactured in their factories, providing it is up to a certain standard, but one proviso is that they shall not stencil any that is made from unclean or unsanitary milk, or made in factories that are unclean or unsanitary, so that I anticipate there will be a large number who will know that they cannot stencil it. Upon the other hand, there is a law making it an offense, to be punished by fine or imprisonment, for receiving milk that is unclean or unsanitary and manufacturing it into food product, and also for keeping an unclean or unsanitary factory, so I don't know but we shall catch them coming and going. We ought to, for there is no one thing so important to promote the best interests of the dairy work of this state as to get a higher degree of cleanliness in the milk furnished to factories and in the factories themselves. Another law that Mr. Curtin is interested in, and he has good sentiment in the legislature back of him, is to require that the Dairy and Food Commissioner, on application, shall send an inspector to warehouses where cheese is stored, or is in curing rooms, or other dairy products, and score those dairy products, and that that score shall stand in the courts as the official score. These are all pretty strenuous measures, but they seem to be in the line of dairy progress and if we all work together to promote the better dairy interests of the state, there is a wide opportunity for progress along the line of quality. It has been mentioned here that Minnesota was ahead of Wisconsin at the

St. Louis fair. I believe that in the matter of the selection and the care of dairy cattle, as well as the breeding, Minnesota has much to learn of Wisconsin, but when we come to the creamery interests, Wisconsin can learn a great deal from Minnesota. Many years ago, early in our history, we won great prizes and we have been rather resting on our oars, we have been proclaiming ourselves a great dairy state and feeling great pride, but this attitude is never promotive of progress. What we need to feel is that there is a great opportunity for us to improve, and especially along the line of cleanliness in these products, and this is the first essential to quality.

Mr. Lamont: I don't know much about making butter and I know less about making cheese, but when I go out through this county and find stacked up on the depot platforms whole carloads of boxes marked to be sent to Crosby & Meyer of Chicago, Ills., I can't help but think that if it is good cheese, these parties are putting on the market, it ought to be marked and credited to Marathon county or Clark county or in some way designate where it came from.

Mr. Emery: That is true. Some of our best butter never reaches Chicago under any distinguishing name. It is labeled "Fox River Butter Company," and Wisconsin gets no credit for that best quality of butter. It is the poor butter that gets on the market and we get the credit for that. It seems to me that the better quality—all qualities should be labeled, stamped, marked.

Mr. Aderhold: Don't you think that the dealers would object to that?

Mr. Emery: I presume they would, but isn't that in the interest of the purchaser, that their wishes should be consulted?

Mr. Aderhold: If they can get just as much for the poorer quality somewhere else, it is not.

MAKING MILK IN WINTER, ITS ADVANTAGES AND DISADVANTAGES.

F. H. Scribner, Rosendale.

A man to be successful in winter dairying must have at least three faculties,—First, a faculty of caring for cows; there is no place in the dairy business for the careless, slipshod workman. Second, he must be a good business man, and third, he must be naturally neat. Man found the cow a mother only, and by his direction of her tendencies he has enlarged her into a profit maker long after the period, she in her early state was concerned in supplying sustenance to her offspring.

This new life and widened usefulness of the good cow, to me is a great privilege and one of the most beautiful accomplishments of man. In nature we find, as a rule, the cow a mother only in the spring when the weather and feed are most conducive to the rearing of the young, but man with his greed for gain, has changed the order of things and found that more profit can be obtained by having her freshen in the fall, and he is indeed a wise man who realizes and meets all the needs of this new creature that has come under his care.

One of the most efficient means of increasing the productiveness of the cow, is to lengthen her milking period. The cow that freshens in the spring milks well for a while and when hot weather and flies come naturally dries off, and by fall is practically dry. The fall cow with good care and feed milks well through the winter and when spring comes with its balmy air, and rich milk producing feed, again freshens as it were, and is practically as good as a fresh cow and will milk well till flies and hot weather come, and then is ready to dry again, which means as a rule that we have lengthened her milking period about two months.

This ideal cow of ours will have the best of care at all times, be regularly fed, watered and milked. I should want this cow in winter time to have a good comfortable stall, wide enough so she may lie down with ease, and not so long that she cannot be kept clean. The temperature should not go below freezing, and the ventilation especially looked after. I believe it is

beneficial for every animal to take a little fresh air every day, unless the weather be too disagreeable. Realizing that we are breeders as well as milk producers, and that the constitution is a great factor in either, so ours are turned out every day while the stables are being cleaned and bedded.

She should be consulted as to her bill of fare. A variety is always desirable, and the digestibility of foods should always be considered. The clover hay should be cut at the right time and properly cured. Don't palm off onto your cows hay that has been cut after the blossoms have left it.

Ensilage of course is par excellence, and I believe has been a great factor in the development of the dairy cow of today and also in the economic production of milk. Many a cow with fair results could be made to produce double if she had the proper material in the shape of food to work up into milk. The machine may be all right but the material all wrong. We must have both to have success, so I class ensilage first in the ranks of economical feed stuffs. She must of necessity consume large quantities of nutritious feed if she gives a large and paying amount of milk. She cannot consume dry feed enough and digest it, to work her milk-producing power to full capacity. Without succulent, easily digested foods, her digestive machinery is overtaxed and she does not thrive and produce to the limit of her capabilities.

But this I say, "He which soweth sparingly shall reap also sparingly; and he which soweth bountifully shall reap also bountifully."

The grain ration is where a good many fall down. We ought to remember it is on the amount fed over and above actual maintenance from which we are to derive our profits, and that we must feed with a liberal hand. All there is of profit in such an animal, aside from her calf, lies in the balance left after furnishing her a living. So it behooves us to make this living as comprehensive, and at the same time as cheap as possible.

A good many are trying to make milk without protein, and I want to say right here "It can't be done." I believe we should feed protein wherever we can buy it most cheaply, whether in the bran, the gluten or the oil meal. It is the feeder's business to study the animals under his care, and if he does this he will be able to tell how much to feed. If a cow

is in full flow of milk and does not lay on fat, her appetite will be a good guide to go by. Let her have all the grain she will eat up clean and she will make good use of it.

One of the greatest drawbacks of really profitable winter dairying is that many keep their cows so poorly through the summer that it takes half the winter to get them into working condition, and a part if not all the profit is lost in so doing. It is an old and true saying: "An animal well summered is half wintered and well wintered is half summered." It seems indeed very short sighted to see a herd of cows in July and August on short pasture, hardly fit for a flock of sheep, and this their only means of maintenance. If enough ensilage has not been stored for this occasion, a series of soiling crops should be grown that shall insure their continued profit through the entire year. If our dairies are to be run as profitable yearly enterprises, guarding against any period of under feeding during the year must have our most careful attention.

So far through my paper the most significant theme has been the feed question. No matter how skilled we may be in breeding and making nicks, crosses and out-crosses, and we may mark the pedigrees all over with red ink, but after all, the main thing with the cow is her feed, and unless she and her offspring are fed enough and well, the granddaughter will be a scrub and dear at most any price.

A good dairyman does not chance to have good cows. It is with him a business proposition, and he fully understands the necessity of good blood linked together with good feed and care, and also knows the necessity of rearing the heifer calves in such a way that they will be profitable producers.

I believe that a great deal of the discouragement to dairy-men is that they are trying to do the work with the wrong kind of a machine, and the results they have obtained were not very flattering.

The special purpose cow is one means of securing success in dairying. The real value of a fine milch cow lies in her pedigree, her prepotent power of heredity, that power that a long line of good ancestors gives her to pass her good qualities along to her offspring; so that a great deal depends upon the man, as to whether he is wise in the selection of the kind of animal for

the work, and with the care and feed there is nothing to hinder the dairyman from being master of the situation and having conditions favorable to his ambitions.

DISCUSSION.

Mrs. Howie: What do you recommend for soiling crops?

Mr. Scribner: I recommend the silo above all things. If a man has a silo, he has everything there convenient, always ready. Of course I realize that the state of Wisconsin is, as a rule, destitute of what we call good summer soiling. The first thing would be to supply something that they can use for a soiling crop. I received a letter from a man in the southern part of the state, saying that his clover was gone, that he didn't want to buy bran, and gluten was too expensive, and would I advise him what to grow for the next summer. Well, I was hard up to answer him.

Mr. Howard: Wouldn't you advise putting in a few acres of alfalfa?

Mr. Scribner: Of course alfalfa is an uncertain quantity yet in Wisconsin. If you can get it to grow, you will have a fine crop of milk producing food. It would be well for every farmer to try a little patch and learn how to handle it.

The Chairman: If Mr. Howard hasn't got silage, what could he plant for rotation and soiling crops?

Mr. Scribner: I should in the fall grow a small piece of winter rye. That will last you two weeks, probably three. Then I would sow as early as I could get onto the ground some peas and oats, and if you are successful in raising clover, your clover will begin to come on about that time, and of course there is nothing better. Plant some early corn and have that.

Ex-Gov. Hoard: About what time do you find that cows begin to shrink and need the soiling crop?

Mr. Scribner: Well, it is usually about the last of June or the first of July. I tell you the flower of the season lasts but a little while. We get our best results only a very short time, I don't believe more than six weeks, so we want to prepare for these occasions. I never found the time yet, I don't care how

good the year was, but what we had a drought some time of the year, and we always want to prepare for it. That is where we as dairymen have been very lame, in allowing our cows to go down. When they begin to shrink on their milk, we want to look out for it and we can always tell if we look out in the right way. I don't believe there is more than one man in fifty that has a milk sheet in his barn, and he ought to have it, then he will know. If we don't weigh our milk, we can't realize it, and if we do weigh it we can tell in an instant whether a cow is shrinking or not.

Ex-Gov. Hoard: It is not alone for just during the summer that a cow should be kept up, but it is for the sake of getting a larger flow of milk in the fall when milk is higher.

Mr. Scribner: Yes, we should not allow them to shrink through July and August, because we want them to give milk in the fall and through the winter, when the prices are always highest. Butter now is thirty cents a pound. We wish we had a lot of it, and we can only have it by planning for it; have our cows freshen in the fall. I believe a man can make at least twenty-five per cent more out of his cows by having them freshen in the fall than in the spring. We like to have them freshen in October. At that time we are in shape to take care of them, we have got a good deal of our fall work done, we can feed them better, and as soon as we get our cows into the barn on our winter ration, we know just what we can do then if we have got the right kind of feed. We ought to feed more silage; if I lived here in Marathon county, I should have a silo above all things, because the corn crop is so uncertain here in the northern part of Wisconsin and if we have the silo we can get the very best results.

The Chairman: What happens to a cow when you turn her out to grass in May after calving the first of November?

Mr. Scribner: We find that they revive up in their milk and I think as a rule the yield is higher at that time than if they had freshened in the spring, and we get just about as good results.

Mr. Howard: Do you think the average farmer will do better to have his cows freshen in the fall than in the spring?

Mr. Scribner: I have no doubt of it. It is the very worst thing I know of to put a young calf out on pasture in the

spring. Skim milk and grass do not make a good combination. The stable is the best place for the calf. If they are fed on good skim milk and you have your clover hay and oats you can carry them over the winter and by spring they are old enough to go out on grass, but even then our calves are kept in and fed milk up to a-year old.

Ex-Gov. Hoard: Do you use a separator on the farm?

Mr. Scribner: Yes, and I use the separator skim milk for our calves and I have never found any better use for it than to put it into calves.

Mr. Emery: You spoke of the silo for the purpose of getting corn in ahead of the frost. Do you recommend unripe corn for the silo?

Mr. Scribner: By no means, but it is the next best thing that we can use.

Mr. Goodrich: You save all the feeding value there is in the corn in that way.

The Chairman: The point you make is that the silo will not make unripe corn equal to ripe corn, but it will make it better than any other process.

Mr. Scribner: I would like to ask all the gentlemen in the room who have silos to hold up their hands. Well, there are a few, and I am glad of it. Now, how many in Marathon county? There are six. That is a splendid good showing.

Mr. Rietbrock: And I think there are two that are not here.

Mr. Jacobs: If your cows are spring freshened cows, do you think it is a safe proposition to carry them over and have them give milk long enough so as to come in a year from the next fall?

Mr. Scribner: I wouldn't do it all in one year, I would divide the period up and be two years in making the change over. Commence with the heifers, milk the heifer a long time the first time, milk her a full year or more, and then the next year you can change her over. Of course, there is no time of year when a heifer will do as well as to freshen in the spring, because the grass and everything is conducive to making her give a large flow of milk. We want to have practically the same kind of food to encourage her to make up a good udder and give a large flow. We are not letting our heifers freshen as early as we used to, which was at two years, and I would do that yet

with a common heifer, but for strictly dairy breeds I believe two years and a half is all right. They have a stronger constitution and better udders. We have two heifers this year that have made over 500 pounds with their first calves. They must have lots of constitution, because we are going to ask a big lot of work from those heifers, and I believe if they do not freshen too young they will have more constitution.

Mr. Wright: There are a number of our farmers near the city who are feeding pea silage from the canning factory. They put it up in a big stack and then they sell it out in sections, and some of them have asked me what to feed with that to make a balanced ration, something in the way of dry feed. I would like Mr. Ditzel to tell about Albert Johnson's experience; he is feeding pea silage and he is getting more milk than any other man on the road.

Mr. Ditzel: All I know about is that Mr. Johnson claims he feeds nothing but pea silage. He claims he hasn't fed a bit of hay with it.

The Chairman: What grain does he feed?

Mr. Ditzel: I don't know whether he feeds any grain or not.

Mr. Goodrich: Peas have about the same amount of protein that alfalfa has.

Mr. Scribner: I wouldn't want to depend entirely upon peas for a ration. It would be like feeding ensilage; we make a mistake if we allow our cows to eat ensilage only. They crave something else, they must have some dry feed in order to do well. So we feed some dry hay and feed liberally with grain. Bran is principally our ration, with gluten meal or gluten feed.

Mr. Howard: I have a friend about ten miles from Eau Claire and they have got a canning factory and there are a good many peas left in that ensilage. They feed oats and bran together and some marsh hay, and they claim that they eat the marsh hay a good deal better than they did before.

Mr. Quaw: I think it would be a benefit to some of us who have not got silos but intend to build, to know the best condition of the corn crop to put in the silo to make the best quality of ensilage.

Mr. Scribner: Well, the time that I should begin to cut it would be just before you would cut it for field purposes. That

is the time when I believe it is in the very best condition to get the most out of it, not only for the corn but for the fodder itself. If we were going to cut it to get the most value as fodder, we would get a little bit on the green side; if we wait too long, it will get too hard, woody. Otherwise, if we cut it too much on the green side, we will have a poor quality of silage, so there is just the happy medium just before the corn is fit to cut for field purposes, and then put it in as quickly as possible.

Mr. Rietbrock: Your answer leaves us a little bit in doubt, because we have first to find out when it should be cut for field purposes. I have heard it said that the right time to cut it would be when Dent corn is just denting, coming out of the milk and into the glazed stage.

The Chairman: It will help it still more to say, perhaps, when the husk begins to turn yellow.

Mr. Scribner: That is good. We go into a field and examine the ears and perhaps we will find one quarter of the ears have become dented and then is the time we commence to cut for the silo.

Mr. Rietbrock: Will you explain just what you mean by "dented"?

Mr. Scribner: Some of these city men don't know much about corn.

Mr. Goodrich: I have got a kind of a notion of my own about that. My test is when the lower leaves of the corn stalks begin to turn yellow and when the earliest ears of corn turn white, and that would be just about as Mr. Scribner describes it. At that time it has the greatest digestible food value, taking the whole plant, the corn and the stalk together.

Mr. Scribner: There is a little difference in different years. You take exceptionally wet weather and we won't find these lower leaves turning yellow, because there has been so much moisture and the stalk is full of moisture and has not turned yellow, although some of the ears have begun to dent, so that rule would not apply every year.

Mr. Rietbrock: Then in an excessively dry year, those leaves will begin to turn yellow before the corn is dented?

Mr. Scribner: Yes, that is true. A man has to have good sense, use his judgment all through. If the leaves have turned white and if your stalks have begun to turn white, you can't

cut it any to quick. You must have a certain degree of moisture in there in order to get the best results.

Mr. Vanderblum: What kind of silage would corn make that the ears were just formed before frost?

Mr. Scribner: It would make a very poor quality of silage; it would be sour. A number of years ago we tried putting it in green and we found it very unsatisfactory, and the cattle did not thrive so well on it. When we came to learn more about silage, we found that the corn should be more mature and then we have sweeter silage for the cows and they thrive better on it.

Mr. Rietbrock: How is flint corn for silage?

Mr. Scribner: It is all right inasmuch as the corn would be very good indeed and there is a great deal of leaves on flint corn, but there wouldn't be so much of it.

Mr. Goodrich: In a latitude where dent corn would not sufficiently mature, wouldn't you advise raising something else?

Mr. Scribner: I would certainly advise a man to raise a corn that would mature in his locality, although you perhaps might not get so much to the acre, yet the quality would be enough better to make it up. Men are learning to grow corn. One great trouble in growing corn is that we do not prepare the ground. I think the ground should be prepared before you are ready to plant it, stir it up thoroughly and let the sunshine in to warm it. Fall plow it if you can. If you can't, then have fall conditions in the spring as near as possible. Of course, on fall plowed ground, we find it in a compact condition. You want to have that same condition in the spring, go on with your roller and pack it down, make it compact. Stir this land up, warm it up and you can plant corn sometimes a week or ten days earlier than if you let that ground lie in that condition without being stirred.

Mr. Rietbrock: If you turn over a clover stubble in the fall, would you plow that in the spring?

Mr. Scribner: No, I would go on with my disk harrow and stir it up.

A Member: Suppose your corn has become dry? Can't you supply moisture for that silage to make it heat up to the proper degree so that you will have sweet silage instead of sour?

Mr. Scribner: Yes, you can supply it and get fairly good

results, but it never takes the place of the natural juices in the stalk.

A Member: Sometimes your silage is too green, has too much juice in it. What would you do in that case?

Mr. Scribner: I don't know. Do the best you can, let it wilt and dry out.

Mr. Rietbrock: I have been told that in Canada when they get it into that condition, they put it into a pretty good sized shock and leave it there for a while until it is partly dried out, and then take it from the shock and put it in the silo.

Mr. Scribner: I doubt if it helps it any. We cut it right down and put it in the silo as quick as we can.

CARE OF MILK ON THE FARM.

Prof. E. H. Farrington, Madison.

(Prof. Farrington: There was one thing brought out yesterday that I would like to make a little more impressive if I can. From my experience as a student myself and my experience with students that I am teaching, I find that things that we see with our own eyes are the things that make the most impression, while those that we hear do not stay with us very long. There was a point brought out yesterday that I want to fix in your mind if I can, so you will take it home with you, because it is a very strong argument in favor of dairying. One of these charts of Prof. Beach's showed us that the manurial value of a ton of hay carried off the farm is \$4.00, that is, that every ton of hay you sell off your farm carries off four dollars worth of actual manurial value. Now, on the other hand, it is a fact that the manurial value carried off a farm in a ton of butter is but fifty cents. If you will think about that and fix it in your memory, I think in the future it will have a tendency to make you hesitate to send off such large quantities as will go in the hay crop.)

This is a subject that will always be discussed at dairymen's

meetings because it has such an important bearing on the quality and value of dairy products. The same advice and directions are repeated each year and they are probably familiar maxims to at least one-half of every audience that listens to them.

At the annual meeting of the Illinois Dairymen's Association last month, the president of the Association, in the course of his address, quoted a few statements about the care of milk from a paper over forty years old. They were the same old story we are all familiar with, about the necessity of keeping dirt out of milk, and cooling both milk and cream if one wishes to keep them sweet.

Each generation travels over nearly the same path in many walks of life and the milk way is about the same now that it was in our father's time. A few things have been learned during the past forty years about the causes of defects in dairy products and some reasons why milk is spoiled by dirt have been discovered, but the fundamental principles regarding the care of milk are the same today that they always have been.

An enormous amount of milk is consumed in the United States every year. It is estimated that the milk sold from house to house amounts to the production of about 7,600,000 cows, and that used in butter making to 9,700,000 cows and in cheese making 800,000 cows.* It has also been estimated by the Illinois Experiment Station that the 2,000,000 people which live in the city of Chicago consume over ten tons of dirt every year in their milk. These figures are startling although they are undoubtedly true, and while a little filth dropping into the milk pail may not seem to amount to much to the milker at the time, it is contributing to the tons of dirt we are all unconsciously consuming in our milk supply.

HIGH PRICED MILK.

A realizing sense of the truth of such statements as the foregoing, as well as the frequent proof that contagious diseases have been spread by means of milk, makes people in some localities willing to pay twelve cents per quart for milk which they

*U. S. Dept. Agr. Farmers' Institute, lecture No. 1.

know is perfectly pure and clean. The increasing number of sanitary milk producing farms, where milk is simply protected from dust and dirt to such an extent that it will keep sweet for weeks, is certainly an indication of an advancement of civilization.

We all know that most of the milk brought to creameries will not keep sweet for more than one day in warm weather, and most of us know the reason why milk spoils so quickly, but we also know that it is not the fault of the cows; they are innocent of any wrong doing; it is the person that feeds and milks the cow that is responsible for the dirt in milk, and if the milk producer wants to get a higher price than he is now receiving, no matter to whom he is selling it, the surest way for him to accomplish this is to keep the milk clean. There is always a good demand for pure milk, and when a factory receives such milk the butter, cheese or household milk which it sells from its supply will be so improved in quality that a higher price can be demanded for it. Persons buying such milk will be glad to pay an extra price for it. This has been the case in many instances and the reputation of a farm or a factory that is based on the purity of its products is standing on a firm foundation; certainly everyone that is connected with such an enterprise may justly be proud of it. A reputation of this kind arouses an interest in one's work and puts the necessary effort to obtain it on a higher plane than that of mere drudgery.

If a number of farmers are sending milk to the same factory and the products of that factory are of unusual good quality, because of the purity of the milk received, the business is going to prosper and the farmers will receive the benefit of its prosperity; but when, on the other hand, the milk is dirty and tainted, the factory receiving it will soon go out of business because of the poor quality of its products, the farmers will have no market for their milk, or they will be obliged to send it to some factory where cheap goods are made and a second hand price paid for the milk.

DANGERS IN MILK.

Milk is one of the most nutritious and healthful of foods and it may be one of the most dangerous of foods. Many contagious

diseases are spread by milk. Germs or bacteria find in milk the best place possible for them to grow. After they get into milk the only way to check or stop their growth is to cool it to near 50° F. or heat it to at least 150° F.; the latter treatment will destroy nearly all the germs.

Many astonishing statements and sentences with long words in them can easily be reeled off on the subject of bacteria in milk, but it is sufficient here to say that the dust and air of most cow stables is loaded with bacteria, and when they get into the milk they multiply at the rate of millions per minute. This ought to be a sufficiently startling statement to cause the milker who has never heard it before to pause and consider his ways. His duty to his family and to humanity in general when he is milking is a serious matter. Is the air of the stable pure and free from dust during milking? Would he be willing and glad to eat a plate of soup while he is milking a cow? If not, why not? Isn't milk a human food and isn't the milk pail that is under the cow being filled with food for his table? I have known of a number of instances where a table was set in a cow stable, the ventilation was so good and the place kept so neat and clean that the most fastidious person could not object to taking lunch with the cows. There are not many such stables in the United States, but they are increasing in number every year and the owner of such a stable must certainly be proud of it. Are you proud of the place where your cows are kept and would you be beaming with smiles if the persons who buy your milk should call on you in the stables at milking time?

Many cases are on record which prove conclusively that milk has been the means of spreading such contagious diseases as tuberculosis, diphtheria, typhoid fever and scarlet fever. Such a possibility as this certainly ought to convince a milker that his work is a serious business and while he cannot see the germs that fill the air around the milk pail, he can at least take every precaution possible to keep the milk free from dust and dirt of every description while he is milking.

People who handle our milk supply may be divided into two classes—first, those who know how to take proper care of it but fail to do so, and, second, those who really do not know just what things ought to be done in order to keep milk in the purest con-

dition possible until it reaches the consumer or the factory which is to manufacture it into butter or cheese.

The first class of milk producers who know their duty but fail to perform it need preaching of another sort than I am able to give them. They need to experience a change of heart or of ambition. But I may be able to be of some aid to the second class by enumerating a few general directions that have been found to be of practical value for the care of milk at the farm.

CARE OF STABLE, MILK HOUSE AND YARD.

A *milk house* is a very necessary building or room for any farm. If you do not have one, plan to build it at once; place it near the well so that all the water from the windmill or some other power will pass through a tank in the milk house to the stock watering tank. This is a good arrangement as it keeps the cans of milk cool if they are set in the water tank.

Setting the cans of milk into the stock watering tank is not a good practice because the cans have no protection from the sun in hot weather or from wind and dust during any season of the year.

The cow stable ought to be whitewashed inside with a spray pump. This should be repeated from one to four times each year.

After cleaning out the cow stable, at least twice each day, sprinkle land plaster over the floor to aid in absorbing the liquid and in preserving the wooden floors; cement floors do not need plaster as they may be flushed with water from a hose. Cement mangers and iron stalls are now put into cow stables and are proving very satisfactory. Good ventilation, clean bedding and plenty of light and comfortable stalls are also necessary in the cow stable. Dusty bedding and any feed that is dusty will seed it with millions of germs and these will develop taints and defects that are not desirable. The number of bacteria in the air near the cow's udder while she is being milked has been determined under various conditions of bedding and after different ways of cleaning the cows; these showed that a great many more germs were present in the dusty air under the cow than that outside the stable, and that the bacteria increased in number with the dis-

tance of the bedding and the amount of manure left hanging to the cow's flanks and body.

Pools of standing water in the yard, around the watering tank or in the pasture ought to be drained or fenced off to prevent the cow getting into the stagnant water. When cows walk through such places more or less mud sticks to their legs and body making the milker a great deal of trouble when he tries to clean the cows. The dust from this mud finds its way very easily into the milk at milking time and helps to increase its weight but not its measure. Such milk sours quickly and the dangers from diseases are increased with the amount of mud in the milk.

Deep wells, springs, or running water are the best sources of supply for watering cows.

CARE OF THE COWS.

A large portion of the impurities which find their way into milk are brought to it at milking time. If the cows are not cleaned or brushed just before milking more or less loose hair and dirt fall into the milk pail. This can be entirely prevented by brushing and then washing and drying the cow's udder just before milking. In dairies where sanitary milk that does not sour for several days is produced, the cow's udder is always washed and dried immediately before she is milked; the milker then washes his hands, puts on a white suit and milks into a covered milk pail provided with only a small opening in the cover to milk into.

Careful work of this kind protects the milk from many impurities and it increases the consumer's desire for more milk when he knows that such precautions are taken against impurities getting into the milk. Many people undoubtedly would want milk to drink if they felt a greater confidence in the purity of the milk than they now have. Their knowledge in a general way of the barn conditions where many cows are milked is not apt to increase their desire for milk.

Some experiments made by Professor Beach in Connecticut showed that the amount of dirt found in milk when covered pails are used at milking time was about one-third as much as was found when milking was done in an open pail. The milk

pail cover excluded 63 per cent and the strainer used after milking less than 47 per cent of the dirt found in the milk when covers and strainers were not used.

Bloody milk and that from an unhealthy cow ought not to be used at any time. A case is on record where the diseased hoof of a cow caused a loss of about \$18.00 per day at a cheese factory. The trouble was located by means of the Wisconsin curd test and when the milk of this sick cow was kept out the quality of the cheese made at the factory was as good as it ever had been and the loss of \$18.00 per day was stopped.

Milk ought not to be used until about six days after calving and some authorities prefer not to use it for thirty days before calving.

Persons having any contagious disease ought not to milk or handle milk for others, and every milker ought to carefully wash and dry his hands before he begins to milk. Always milk with dry hands. This is so self-evident that further explanation ought not to be necessary.

CARE OF THE MILK.

Immediately after milking strain the milk through four thickness of cheese cloth or one of flannel. The straining ought to be done outside the stable and not behind the cows.

As soon as strained, cool the milk quickly to near 50° F. Sudden cooling helps to preserve the milk and gives it a very acceptable flavor under normal conditions. Failure to cool at once after milking is the cause of a great deal of sour milk.

Never mix warm milk with cold milk but cool both before mixing them. Warm milk will absorb odors more readily than cold and the growth and development of bacteria is checked by keeping the milk at a low temperature.

Some sort of aeration is very beneficial to either milk or cream. It helps the flavor of these products and if the aerator is thoroughly clean no harm can come from mixing milk with pure air. The aeration must be done in a clean place, free from bad odors and dust as the spreading of milk over so much surface as is necessary with many aerators subjects it to any contamination which the surrounding air may contain.

Aeration will aid in removing some feed odors from the milk and it is an easy means of chilling it immediately after milking.

There are three methods of aeration now in use to some extent. First, those which spread the milk out in thin sheets as it flows over their surface or divides the milk into many fine streams as it passes through them. Second, an excellent aeration is obtained by passing the milk through a separator. The cream and skim milk are mixed together as they come from the separator by turning the spouts of the separator so that the skim milk and cream will flow together into one can. By this process a certain amount of matter which is in suspension in the milk is also removed, and this together with the dirt in the milk accumulates in the separator bowl. Third, a certain amount of aeration may be obtained by dipping the milk or stirring it with a long handled dipper. This is something every milk producer can afford to do. The large cans of milk are commonly set into a tank of cold water after milking and the milk is dipped and stirred occasionally until it is thoroughly cold.

A great many kinds of milk aerators are on the market and probably the use of any one of them is beneficial to the milk.

Aeration is the only preservative that is permitted by law to be used in Wisconsin milk; the chemicals advertised for this purpose are injurious to the consumer's health and the addition of any of them to milk, cream or butter in Wisconsin is forbidden.

If milk is well aerated and thoroughly cooled it can be safely held in cans tightly covered, but when it is not aerated the covers ought not to be put on the cans tightly until it is thoroughly cooled. When warm milk is tightly covered it has a tendency to develop what is called "smothered" odor.

ODORS IN MILK.

A great variety of odors are more or less common to milk. Among them may be mentioned feed odors, barn odors, cowey odors and kitchen odors. The feed odors come mostly from musty or decayed feed, pasture weeds, wild onions, turnips, rape, silage, etc.

The feeding of some silage will not necessarily contaminate the flavor of milk. Sufficient proof of this is the fact that silage is being constantly fed to cows that are producing some of the

highest priced milk in the country and 'hat which is much sought for by hospitals because of its purity and its wholesome flavor.

The objection to silage feeding in the majority of cases comes from the poorly ventilated stables. Milk will absorb the silage odor if it is present in the barn and for this reason it is necessary to have the silo closed except when silage is being taken from it at feeding time. All the waste silage that is not eaten by the cows should be removed and not left in the mangers or under the cows for bedding. When this is allowed the air will be so filled with silage odor that it will be absorbed by the milk at milking time. No trouble, however, will come from silage odor when the barn is clean and well ventilated and the silage is fed after milking. Turnips and rape may also be fed without transmitting their characteristic odor to the milk if fed after milking and in not too large quantities at first.

The objectionable flavors in milk that come from the cows eating musty feed, pasture weeds, garlic and wild onions, are not so easily gotten rid of as the silage odor, and such feeds should be avoided.

The cowey, barn, and kitchen odors sometimes so prominent in milk may be removed to a certain extent by aeration, but prevention is preferable to a cure in such cases. Keep the milk out of these places and give it a chance to live by itself where it will not be contaminated by unprofitable neighbors.

When cans of milk are drawn any distance to a railroad station or to a factory they should be covered with a piece of canvass in order to protect them from dust and mud as well as from heat and cold.

If skim milk is returned in the cans to the farms such milk should be emptied out of the cans as soon as they reach the farm, because of the difficulty there is in washing the sour odor from cans if the skim milk is allowed to stand in them until it becomes sour. Washing the milk cans at the creamery and returning them empty to the farmers is an excellent practice. It will remove many causes of failures to make butter, cheese or cream of first class quality.

CLEANING DAIRY UTENSILS.

Milk sours so quickly and the sour smell is so hard to wash out that all dairy utensils ought to be washed very soon after they have been used. The best results are obtained by rinsing off the film of milk with cold water, then washing thoroughly with warm water using a brush to clean out the seams of cans, and finally rinse with scalding hot water and place in the sun or some dustless place to dry. Do not wipe milk tinware with a cloth, but let the rinsing water be so hot that there is no need of further drying than the evaporation of this boiling water.

The strainer cloth needs careful attention as well as the tinware. It should be cleaned and boiled every time it is used.

Anyone advocating the washing of any dairy utensils or machine only once a week is an enemy to the dairy business. Milk and cream cannot be kept in a condition suitable for human food unless they are produced from sound feed in a clean barn and handled in carefully washed utensils.

DISCUSSION.

Prof. Farrington: I saw down near St. Louis something different from anything I have seen in Wisconsin. The entire floor was cement, the gutters and mangers, everything cement, and from the gutters was a large tile that conveyed the liquid manure to a large pit out in the yard, cemented up so it was perfectly tight so that all the liquid manure was conveyed out of the stable the same as you would use a sewer out of your house and it was preserved there as something very valuable and then pumped out and distributed over the farm. I saw two of these and both those men said they would not take any money for that arrangement, and that it was worth more than the expense of the building and the labor of handling the manure. It seems to be the proper way of saving fertility and getting it back to the soil. I wonder if there are any of these cess-pools in this state?

Mr. Goodrich: Mr. Kingman had just that arrangement several years ago. He told me he took out this material in his fields with a sprinkler and just drove around over his pasture,

sprinkling it to see what it would do, and you could see those spots all summer long. In fact, he said he could write his name if he wanted to. I don't know that he did.

Mr. Jones: Mr. Rietbrock has just such an arrangement in Marathon county.

Ex-Gov. Hoard: Supposing a man does not have that arrangement and he uses plenty of absorbents behind the cow and takes up all the liquid in that manner,—he accomplishes practically the same purpose. This land plaster absorbs the ammonia and saves it and it can be hauled out onto his field.

The following scores of butter and cheese exhibited were read by the Secretary:

Cheese.

Exhibitor's Name and Postoffice Address.	Flavor 45.	Texture and stock 30.	Color 15.	Finish 10.	Total 100.
P. H. Kasper, Welcome	48½	29	15	10	97½
Cleveland Creamery Co., Cleveland..	43	29½	14	10	96½
J. F. Bachman, Fremont	43	28	15	9	95
Nick Grimm, Ringle	41½	28	15	10	94½
Aksel Bruhn, Spring Green	42½	28	13½	10	94
H. E. Baumann, Naugart	40	27	15	10	92

Average score, 94.9.

Butter.

Exhibitor's Name and Postoffice Address.	Flavor 45.	Grain 25.	Color 15.	Salting 10.	Packing 5.	Total 100.
W. J. Hynes, Evansville	42	25	15	10	5	97
A. E. Dixon, Evansville	41½	25	15	10	5	96½
Chas. M. Kates, Custer	40½	25	15	10	5	95½
J. E. Boettscher, Waukesha	40	25	15	10	5	95
E. A. Paddock, Kilkhorn	40	25	15	10	5	95
Carl Bjerregaard, Oshkosh	40	25	15	10	5	95
Albert Ehrke, Amery	39	25	15	10	5	94
W. F. Krohn, Whitewater	38	25	15	10	5	93
E. L. Duxbury, Green Bay	38	25	15	10	5	93
James Van Duser, Hebron	37½	25	15	10	5	92½
Fred Rietbrock, Athens	37	25	15	10	5	92
Sunset Creamery Co., Sunset	36½	25	15	10	5	91½
C. F. Blend, Irma, Wis.	34	25	15	10	5	89
O. E. Knoke, New London	34	25	15	10	5	89
S. Haight, Rockdale	35	25	14	9½	5	88½
Norman Ovitt, Black Creek	33	25	15	10	5	88

Average score, 92.63 points.

Recess to 1:30 P. M.

The convention met at 1:30 P. M., same day.

President Hill in the chair.

The Chairman: We will resume the discussion on Prof. Farrington's valuable paper.

Mr. Aderhold: I want to ask Mr. Baer if he can tell us what is the effect of feeding rape to cows for cheesemaking purposes?

Mr. Baer: While I was connected with the Experiment Station, two or three years ago, we carried on a series of experiments in the manufacture of cheese from rape-fed milks and in every instance, in all those experiments, which ran through three years, we found that the flavor of rape was carried over barn; others were driven to fields of growing rape and fed there.

We tried feeding the cows before milking, after milking, and at the time of milking. Occasionally we would get a day's make of cheese where the flavor would not be pronounced until the cheese had begun to break down or cure, after a week or ten days on the curing table, but invariably we found that this rape flavor was imparted to the product when the milk was made into cheese. Oftentimes, we received milk from the barn in splendid condition; so far as we could tell from the taste and smell, it apparently was free from the rape flavor or odor, but after a time, when the cheese began to cure, they would develop a bitter flavor to the taste and it would resemble a cheese made from—I don't know that that illustration will mean anything to you, but I was going to say that the cheese would smell to the expert judge as if it was made from milk where the animal had been fed on cabbage. It had an old, musty, cellar odor to the sense of smell, and as the cheese ripened and cured, it would taste somewhat bitter.

Mr. Emery: I would like to ask Prof. Farrington whether his statement as to making butter from cows where rape had been fed was made as an opinion or from experiment?

Prof. Farrington: We did make some butter from milk from cows that were fed rape, quite a number of times and we offered the samples of butter, sent them to Chicago to commission men to be scored, and they did not select out the samples of butter that were made from this milk from cows that had been

fed rape. The butter, of course, was consumed very soon after it was made, and may not have had a chance to develop a flavor that might possibly develop if kept longer from the milk. I think the flavor is less liable to be developed in butter than in cheese, because butter is consumed much more quickly, and while it is not safe, perhaps, for every one to feed rape, where the milk is to be sent to the creamery, you can feed it and it will have no very bad effect on the quality of butter.

Prof. Humphrey: I think that is true of any kind of feed that produces peculiar flavors in milk. I remember a case at De Pere where a creamery lost considerable money from milk from cows fed on cabbage. I have known of cases where the product scored very high, where I knew that the cows were fed cabbages, but they were fed in small quantities in the barn. I do not think we could cover up the flavor in milk where the cabbage was used in large quantities.

Mr. Aderhold: Prof. Farrington mentioned in his paper that if a stable was not well ventilated, the silage odor might get into the milk. Now, you take such a stable as that, not well ventilated, if it has not got the silage odor, what kind of odor has it, and isn't it worse than the ensilage odor?

Prof. Farrington: I think you can answer that as well as I.

Mr. Emery: Prof. Farrington lays considerable stress upon aerating the milk. Now, in a recent convention of cheesemakers, that question was up for discussion, and many of the experienced makers protested that aerating milk is not necessary, and I understand that some of the institute conductors in Wisconsin are proclaiming the same thing. I would like to know the grounds upon which Prof. Farrington bases his statement, and whether the sudden cooling of the milk to 50 degrees will not meet the case as well as aerating?

Prof. Farrington: I think that all of the objections that have ever been made to aeration were due to the air in which the milk is aerated. If you expose this milk to impure air, or where there is a bad odor, the aeration won't help it; but if you aerate the milk in pure air, you never can do it any harm, and it will certainly benefit its flavor to mix the milk with pure air.

Secy. Burchard: Some years ago I read that in the production of milk at the Morton farm, for consumption in New York City, they aerated the milk by forcing the air through it, pumping the air into it and mixing it with the milk in that way.

Prof. Humphrey: The air there is drawn down from above the peak of the barn and forced through a can of milk with a fan similar to a blacksmith's fan.

Mr. Emery: Is there any other benefit imparted to that milk by aerating it than simply cooling it?

Prof. Farrington: I think it sometimes replaces gases, some impure flavors, by pouring pure air into it.

Mr. Goodrich: Don't you remove some gases that are always in milk. You used to talk about a cowey odor; some of you scientific people said that the cowy odor was produced by dirt, but we know that clean, pure milk has got a peculiar odor that sometimes a little child objects to, and after those gases have been dissipated there is a different taste to the milk.

Mrs. Howie: Prof. Farrington, do you think a good healthy cow, properly cared for and groomed, and the best possible care taken of the milk, that it would be necessary to aerate that milk, provided it was plunged into ice water, stirred and cooled rapidly?

Prof. Farrington: I think not.

Mr. Moore: Mrs. Howie has described an ideal condition. As a rule, the people who do the milking on our farms are people who are tired out with the work of the day, and you can not expect those people to stand over a can of milk and use their labor and time to stir it, and that is one reason I advocate the use of the aerator. Of course, I want it surrounded by some safeguard so as to have pure air. I visited a creamery day before yesterday, and the butter maker told me that by getting his patrons to use aerators, he had had a decided improvement in the milk from those patrons.

Mr. Emery: But does that come from any qualities imparted in the air, or simply the quick cooling of the milk?

Prof. Moore: The air removes what we call the volatile odors or gas.

Mr. Everett: I believe that even under the conditions mentioned by Mrs. Howie, aeration will benefit the qual-

ity of the milk, and in substantiation of that belief I want to state that H. B. Gurler, who manufactures certified milk that sells for twelve cents a quart and is recommended by the physicians of Chicago for infants and invalids, has as perfect conditions perhaps as can be found in this country, yet that pure milk as it comes from his cows in the most cleanly manner and surroundings is run over an aerator.

Mrs. Howie: Referring to what Mr. Emery said about the milking coming among the extra chores of the men, I want to say that the washing and care of the aerator falls upon the woman as a usual thing. You will find a couple of those aerators up in my attic today. We use a long-handled spoon that costs fifteen cents, and I would prefer to stir the milk in one of those shotgun cans for fifteen minutes to washing one of those separators.

The Chairman: What kind of an aerator was it?

Mrs. Howie: It is a large aerator that the milk flows over the sides, and I found I lost about a pound of milk every time, sticking to the sides of it.

Mr. Moore: How much did it cost?

Mrs. Howie: Eight dollars, and you may have it for two, and it is in good condition.

Mr. Moore: I had an aerator made at the shop, a pail with an iron tripod with a thumbscrew, so it can be raised or lowered, with holes in the bottom, so the milk passes through in minute streams. That only cost 75 cents to a dollar and is no more trouble to wash than a common pail.

Mr. Wright: Would you professors recommend the use of an aerator where we had no milk house? My experience is, there is no use talking about aerators until you have a milk house. If you put one up in one of these big barns, you will hurt the milk more by the dirt and stuff you get into it than the aerator will get out.

Mr. Moore: We don't want you to use the aerator in the barn; put it out doors. One of the best farmers of the state of Minnesota, with a large farm and using a silo, describes his method of keeping his milk, and he never has sour milk or frozen milk and never had any milk rejected from the creamery in twelve years, and all he has is a large wooden tank outside,

near the well, inside of which is an iron tank, and it is packed with some insulating material and filled in with straw, and has a good, tight cover. It is fixed so that water can be kept a little above the middle of the cans with running water and he is never troubled with freezing. The whole thing wouldn't cost more than eight or ten dollars.

REPORTS OF COMMITTEES.

The reports of the following committees were received and adopted:

RESOLUTIONS.

Resolved, That this Association hereby express its deep sympathy for our treasurer, Mr. H. K. Loomis, on account of the serious illness of his wife which prevents him from being present at this meeting, thus depriving us of his valuable services, this being the first and only time he has been absent from our yearly meeting during the long period of years.

Resolved. That we express our approval of the effort that is being made to conduct an annual butter and cheese scoring contest or exhibit and that we urge the legislature to provide the necessary appropriation for meeting the expenses of this educational work.

Resolved, That the sincere thanks of this Association are due the citizens of the city of Wausau for the excellent manner in which they have entertained and cared for us, and for their evident appreciation of the object and aims of this Association. And we are also encouraged by the lively and intelligent interest taken in the subjects discussed in our meetings by many of the farmers and dairymen of Marathon county which gives us good grounds to believe that this splendid county at no distant day will, as it ought to, take a foremost rank as a dairy county in this great dairy state of Wisconsin; and we also resolve that we will never forget the splendid banquet that was served to us by the citizens of Wausau.

Resolved, That the Association regards with pronounced opposition the effort the oleomargarine manufacturers are making to lower the ten cent Federal tax on their product when colored in imitation of butter. Their argument that this tax is a hardship to the poor is false for the reason that on the uncolored product there is practically no tax. What they are really after is an opportunity to swindle the consumer by selling him colored packing house grease for the pure product of the cow. The present ten cent tax stands in their way of consummating this villany.

Resolved, That this Association calls upon the Wisconsin members of congress in both houses to do all in their power to prevent any such reduction believing as we do that the maintenance of the law is emphatically in the interest of the consumer as well as the producer of butter.

Resolved, That this Association desires to express its warm sympathy with President Roosevelt in his effort to have all transportation abuses done away, to the end that a "square deal" and even chances may be accorded to every shipper. As producers of butter and cheese finding market and consumption in distant portions of the country the dairymen of Wisconsin are vitally interested in this question.

Resolved, That this Association is heartily in favor of the movement now before the legislature of Wisconsin to establish a state railroad rate commission before which questions of overcharge and discrimination may be referred for correction and adjustment.

Resolved, That the Wisconsin Dairymen's Association assembled in the thirty-third annual session at the city of Wausau hereby records its judgment that under the legislation of the past, the expansion of the Wisconsin Dairy and Food Commission since its establishment in 1889, has not been commensurate with that of other departments of our state government, nor with that of like departments of neighboring states, nor has its expansion been commensurate with the vastness of the interests it was established to promote. We record our protest against a continuance of the restrictive or non-expansive policy of the past and we most urgently request the present legislature to provide a sufficiently liberal number of assistants and in-

spectors for the dairy and food commission, to furnish adequate instruction and inspection for the cheese factories, creameries and dairies of this great dairy state to the end that the quality of our dairy and other food products may be the equal of the best in other states.

EXHIBITS.

The committee on Exhibits and Dairy Machinery would respectfully report that the 16 entries of butter show by the average score of 93 that its quality is above the average for this season of the year; and the average score of 95 on the 5 entries of cheese is also an extremely high one.

The exhibits of dairy machinery included the following styles of hand separators: The De Laval, the Empire, the Sharples and the United States. A collection of churns, butter-workers, aerators, patent milk pails and other appliances used in the farm dairy was shown by the Creamery Package Manufacturing Co. of Chicago. Attention was drawn to the Wyandotte cleaning and washing powder, by a coop of Wyandotte chickens, which was surrounded by many small sacks of this powder.

The display of agricultural products included samples of potatoes, grains, other farm seeds and vegetables of the usual superior quality characteristic of these products grown in Marathon county.

An exhibit of ten samples of soil taken from as many different farms east and west of the city of Wausau—23 miles east and 36 miles to the west—by the students of Marathon County Agricultural School illustrated the excellent quality of the soil in this section. A very attractive display of honey, both in the comb and extracted, was exhibited by Mr. Robert Morgenstern.

E. H. FARRINGTON.

T. CORNELIUSEN.

R. B. JOHNS.

FINANCE.

We, the members of the Finance committee, having examined the bills and vouchers of secretary and treasurer of the Wisconsin State Dairymen's Association, find them correct to the best of our ability.

F. H. SCRIBNER,

W. ERBACH,

U. S. BAER,

Committee.

Wausau, Feb. 10, 1904.

The committee on nominations reported by Mr. Taylor, Chairman, as follows:

The committee on nominations desire to report at this time that we recommend the continuation of Mr. Hill as President for another year, and also that we continue Mr. Loomis as Treasurer for another year. Regarding the Secretary, your committee has considered the matter, taken quite large council, and are desirous of reporting that in the opinion of the committee no recommendation be made at this meeting for a successor to Mr. Burchard, and that the matter of electing a Secretary to succeed Mr. Burchard be left with the executive committee with power to act.

Mr. Everett: I second the nominations made by the chairman of the committee, and also the recommendation as to the secretaryship.

The motion was put to the house by Mr. Everett and carried unanimously, and Mr. Charles L. Hill declared the duly elected President of the Association for the ensuing year; also Mr. H. K. Loomis declared the duly elected Treasurer for the ensuing year, and the election of the Secretary left to the Executive Board.

President Hill: I am sure I thank you again most heartily for the honor you have conferred upon me, and I consider it an honor indeed. I feel more than ever that I am unworthy of the place, but I will just do the best I can.

**WISCONSIN DAIRY STOCK AT THE LOUISIANA
PURCHASE EXPOSITION.**

H. C. Taylor, Orfordville, Wis.

Mr. Taylor, Mr. Chairman, Ladies and Gentlemen: I want to be absolutely correct and fair and unprejudiced in every statement that I make in regard to this wonderful test at St. Louis, and to avoid any suspicion of incorrectness or unfairness, I am willing to acknowledge that I took my report from the Wisconsin Agriculturist, whose editor is my friend Everett—and I do that openly and above board, before you all. (Mr. Taylor thereupon took his manuscript from a copy of the paper mentioned.)

The dairy cow demonstration at St. Louis brought out representatives of four breeds of cows, viz.: Jerseys, Holsteins, Brown Swiss and Shorthorns, and proved an essential feature and attraction of this the greatest of all Worlds' Fairs.

PLANS OF OPERATION.

Most of you are conversant with the plan and scope of the test, which was non partisan in its management and conduct.

Four barns were built by the Exposition Company and each occupied by one of the breeds entered. Each association appointed a committee and superintendent of its own who selected the cows of each breed they represented. Each superintendent selected his own assistants to milk, feed and care for the cows under his supervision. Each superintendent was allowed to compound the rations for each cow of his breed without restriction. But all feed was weighed and charged to each cow daily. A list of feeds and the price of each was prepared by the official test committee and from this list each breed superintendent selected the feeds he desired.

The weights of these feeds, together with the milk produced daily, were carefully recorded by men employed by the Exposition and stationed in each barn during the entire day. Aside from these two recording or checking clerks was a Jefferson guard detailed to remain in each barn both day and night.

These Jefferson guards were under special instructions from the Exposition authorities.

The feeds were provided by the breed superintendent for his breed, at the expense of the breeders' association he represented. The feed was stored in rooms above the cows and was under lock and key, the keys being carried by the checking clerks. Once a day the feed was weighed out to each cow by the checking clerk and placed in a box marked with the number of the cow. The hay was weighed and placed in sealed sacks. The boxes and sacks were only opened and sealed by the checking clerks and then at feeding time. The herdsman for each breed was allowed to feed as much as he pleased, when the box was relocked and the sacks resealed.

TESTING OF MILK.

At milking time the milk from each cow was weighed and samples taken by the recording clerks. As each cow was milked three times a day, the three samples each day were placed in the same bottle and constituted a composite sample for the three milkings. It was so arranged that the morning's milking would end the day and complete the composite sample. These composite samples were then taken to the laboratory and by the official test committee tested for fat content and solids not fat.

The official test committee was composed of the late Major H. E. Alvord, Chief of the Dairy Division, Washington, D. C.; C. F. Curtis, Dean and Director of Agriculture, Ames, Iowa, and Prof. Farrington, Professor of Dairying of University of Wisconsin. As a result of earnest solicitation by all parties interested, Prof. Farrington took charge of the details and management of the test—a duty that he was well qualified to perform. His rules issued to govern the test were fair to all breeds and in accordance with advanced knowledge of dairying. Through his untiring efforts and thoroughness and unquestioned correctness a vast amount of very valuable data has been secured for the dairy fraternity and students of dairying. A valuable addition to scientific experiment station data of far-reaching value and importance was obtained. Never has been an opportunity afforded for securing such reliable and scientific records as this. The cows were selected by men who were

considered good judges of the breed they represented and endeavored to secure the best representative animals of the breed. Each breed was fed and handled by practical feeders and herds-men who were acquainted with the breed character of the breed he handled. The ration for each cow was provided with reference to its component elements, digestibility, nutritive ratio, and palatability, and was fitted to each cow. The milk was tested by Experiment Station professors of known reputation. Thus these World's Fair records are to be relied upon as correct and impartial, and a study of them will no doubt stimulate many dairymen to do better.

METHODS OF FEEDING.

As the cows were milked and fed three times a day, I desire to give you the routine labor for one day. At 8 o'clock a. m. the locked boxes were taken to the feed room and the daily ration for each cow was weighed into her feed box which was locked and placed on the floor in front of the cow.

Three sacks of hay were weighed out for each cow and placed along side the box containing her grain ration. At noon a feed of silage was weighed out and placed in a box to which was added about one-third of her grain ration provided for her for that day. This was fed at noon, immediately after milking, which was begun at 11:30 and finished at 1:00 p. m. Then each cow was fed one of the three sacks of hay. After this she was watered. From 2:00 p. m. to 5:00 p. m. was a period of rest. At 5:00 p. m. another ration of silage was weighed into the feed box and another portion of feed from each cow's locked box was added to this and fed immediately after milking, which began at 6:00 p. m. Then they were given another sack of hay and watered and left for the night. In the morning the cows were milked and fed the ensilage and grain ration as previously indicated and watered at about 8:30 a. m.

There was quite a difference in the proportion of grain and roughage fed the cows in the different herds. Two herds were fed large quantities of green feed, such as green clover, green corn stalks, etc., with the grain, and the other herds were fed no green feed but larger amounts of grain and silage and hay.

Some idea of the amount and variety of feed consumed daily

by one cow in the different herds is shown by the following figures:

One day's ration of one cow in each herd.

Feed	Brown Swiss.	Holstein.	Jersey.	Shorthorn.
	Lbs.	Lbs.	Lb.	Lbs
Alfalfa hay.	7		18	9
Cut alfalfa hay.....		15	6	
Corn silage.....			16	24
Green cut corn.....	40	15		
Wheat bran.....		2	3	4
Green cow peas.....		35		
Linseed (oil meal).....			2	2
Ground oats.....			2.5	2
Hominy feed.....	8	5	2.5	3
Gluten feed.....			5	2
Corn meal.....			1.5	
Cotton seed meal.....	1	1		3
Corn hearts.....			2.5	2
Distillers grains.....				4
Union grains.....	15	14		
Total.....	71	87	59	54
Grain.....	24	22	19	22
Coarse feed.....	47	65	40	32

Such records as these are probably a revelation to many a man who has fed and milked cows for years. It has not been customary to give more than five to ten pounds of grain per day to cows on the home farm, and the majority of them probably get less than five pounds. A capacity for assimilating large rations is necessary for producing large quantities of milk and butter, and most of the World's Fair cows were fed to their limit of endurance. A daily feeding per cow of near twenty pounds of grain, together with thirty to sixty pounds of green feed was not uncommon, although there were some variations in the amount during the 120 days of the test.

It will be noticed by these figures that two of the herds were fed only three or four kinds of grain per day, while the other two were given seven and eight kinds of grain per cow per day. Small quantities of a large number of different kinds of feed

seemed to be considered by some of the feeders as best adapted to the production of milk, while others fed larger amounts of a few kinds.

Record of the best, poorest and average cow in each herd.

Daily average.

	Brown Swiss.	Holstein.	Jersey.	Shorthorn.
<i>Milk, lbs.</i>				
Best cow, No. 1	51.0	67.5	48.4	43.4
Poorest cow, No. 2	38.5	47.1	38.8	21.4
Average cow	44.2	53.4	41.5	34.6
<i>Test of milk.</i>				
Best cow	3.4	3.5	4.8	4.0
Poorest cow	3.8	3.2	4.1	3.9
Average cow	3.62	3.43	4.7	3.8
<i>Butter fat, lbs.</i>				
Best cow	1.748	2.355	2.334	1.737
Poorest cow	1.477	1.507	1.615	0.843
Average cow	1.566	1.832	1.936	1.277
<i>Butter, lbs.</i>				
Best cow	2.042	2.753	2.750	2.037
Poorest cow	1.731	1.756	1.898	0.988
Average cow	1.870	2.12	2.28	1.485
<i>Solids, not fat, lbs.</i>				
Best cow	4.363	5.171	4.357	3.720
Poorest cow	3.585	3.614	3.441	1.902
Average cow	3.919	4.239	3.634	2.960
<i>Feed cost of milk per quart.*</i>				
Best cow	\$0.0109	\$0.0090	\$0.0110	\$0.0109
Poorest cow	0.0139	0.0122	0.0130	0.0215
Average cow	0.0124	0.0107	0.0116	0.0132
<i>Feed cost of butter per lb.</i>				
Best cow	\$.136	\$.110	\$.097	\$.117
Poorest cow .....	.135	.164	.152	.234
Average cow .....	.147	.135	.105	.153
No. of cows in herd	5	15	25	28

*Assuming two pounds to the quart.

This page of tables is of value to the dairymen because it contains the records of four breeds and four herds of selected cows. Note carefully the large yields of milk and butter. Again observe the difference between the production of the best and poorest cows in each breed represented by these selected herds.

Another item of great interest to us all is set forth on this page and that is the feed cost of one quart of milk and the feed cost of one pound of butter from the best the poorest and average cow in each of these four breeds. The feed cost to produce one pound of butter with Brown Swiss was 14.7 cents, Holstein 13.5 cents, Jerseys 10.5 cents, Short Horns 15.3 cents. One gallon of Brown Swiss milk cost to produce, 4.96 cents, Holstein 4.28 cents, Jersey 4.64 cents, Short Horn 5.28 cents.

Milk and butter produced by each herd in the 120 days.

	Brown Swiss.	Holstein.	Jersey.	Shorthorn.
No. of cows	5	15	25	25 In class B.
Milk, lbs	26,508	96,169.9	124,524.2	103,800.05
Average test	3.62	3.43	4.7	3.6
Butter fat, lbs	957.3	3298.4	5810.6	3835.0
Butter, lbs	1120.5	3817.0	6844.9	.....
Value of butter at 25c	\$280.12	\$954.26	\$1711.25	.....
Solids not fat in milk, lbs	2351.7	7630.9	10902.4	8938.9
Cost of feed	\$164.47	\$515.72	\$720.40	\$864.00

Total feed consumed by each herd during the 120 days.

	Brown Swiss.	Holstein.	Jersey.	Shorthorn.
No of cows	5	15	25	*29
<i>Feed.</i>				
Alfalfa hay	2,001.8	11,386.4	44,971.1	32,997.0
Green clover	3,298.0	10,253.0	.....	.....
Oats and peas	4,989.4	17,725.0	.....	.....
Cut green corn	21,821.0	59,203.5	.....	.....
Bran	525.0	1,811.9	7,851.5	11,588.5
Oil meal	275.6	541.0	5,384	4,737.0
Cottonseed meal	518.45	695.5	1,706	4,602.0
Malt sprouts	2,120.4	.....	.....	.....
Gluten feed	2,416.3	936.3	12,501.8	9,666.0
Hominy feed	4,544.7	3,207.7	1,928.5	7,583.5
Clover hay	2,001.7	96.0	1,274.0	6,206.0
Union grain	3,561.7	22,384.3	.....	.....
Ground oats .....	.....	99.5	2,917.5	8,211.0
Corn meal .....	.....	789.2	9,454.7	967.0
Corn heart .....	.....	4,483.1	1,167.0	6,901.5
Cut alfalfa .....	.....	8,432.0	18,202.9	.....
Cow peas .....	.....	1,706.9	.....	.....
Middlings	131.5	.....	.....	.....
Silage .....	.....	.....	36,782.5	51,587.0
Distillers grains .....	.....	.....	2,688.7	6,221.0
Rollod oats .....	.....	.....	202.0	.....

*One cow died at the end of the first period of sixty days.

This table gives us the total milk and butter production, with the total cost of feed consumed to produce the same. To summarize we find that \$1.00 worth of feed consumed by the Brown Swiss returned \$2.13 in product; Short Horn returned \$2.12; the Holsteins returned \$2.29; Jerseys \$2.84.

*Herd results in ten days periods (first period beginning June 16.)
Figures represent the average per cow per day in each herd.*

Periods.	Brown Swiss.			Holstein.			Jersey.			Shorthorn.		
	Milk.	Test.	Butter fat.	Milk.	Test.	Butter fat.	Milk.	Test.	Butter fat.	Milk.	Test.	Butter fat.
I.....	51.1	3.26	1.67	61.5	3.36	2.07	43.8	4.26	1.86	37.2	3.42	1.27
II.....	51.7	3.21	1.66	57.7	3.40	1.96	44.5	4.36	1.94	36.8	3.44	1.26
III.....	42.2	3.33	1.43	51.5	3.58	1.85	45.1	4.36	1.96	35.2	3.57	1.26
IV.....	44.5	3.56	1.62	47.1	3.57	1.68	43.5	4.53	1.97	39.1	3.59	1.08
V.....	45.8	3.59	1.37	55.3	3.39	1.88	43.9	4.48	1.97	35.4	3.61	1.27
VI.....	46.0	3.68	1.69	55.1	3.30	1.82	42.8	4.61	1.97	36.0	3.69	1.33
VII.....	40.9	3.80	1.55	52.7	3.52	1.85	41.7	4.68	1.95	35.2	3.78	1.33
VIII.....	46.3	3.82	1.77	53.5	3.39	1.81	41.1	4.71	1.93	34.0	3.80	1.29
IX.....	40.7	3.75	1.53	53.5	3.40	1.82	39.8	4.87	1.94	31.6	3.87	1.23
X.....	41.0	3.84	1.57	54.3	3.40	1.85	38.8	5.02	1.95	31.4	3.86	1.21
XI.....	36.4	3.81	1.39	47.7	3.48	1.69	35.7	5.21	1.86	28.7	3.95	1.13
XII.....	42.2	3.66	1.66	50.2	3.41	1.71	37.5	5.13	1.92	28.8	3.86	1.11

In these 12 periods of 10 days each there was a shrinking of the flow of milk towards the last, but a noticeable increase in the per cent of fat. The Brown Swiss gave practically the same quantity of fat the last period that they did the first. The Holsteins gave 2.07 pounds per day the first and 1.71 the last. The Jerseys gave 1.86 the first and 1.92 the last. The Short Horns gave 1.72 the first and 1.11 the last.

Please carefully note the wonderful uniformity of production of some of these herds and then think if you are keeping up the flow in your own herds.

Weight as related to product.

	Milk.	Test	Butter fat.	Butter.	Net profit.	Weight.	
	Lbs.						
Heaviest Holstein, 1,512.....	5,659	3.2	180.9	249.8	\$18.03	1,319	Best.
Lightest Holstein, 1,225.	5,671	3.5	200.2	280.2	25.11	1,512	Poor'st
Heaviest Jersey, 1,141	4,680	5.	234.2	276.1	37.99	1,075	Best.
Lightest Jersey, 809	4,497	4.77	214.8	253.1	36.41	1,089	Poor'st
Heaviest Brown Swiss, 1,501	5,924	3.4	20.15	235.3	23.27	1,285	Best.
Lightest Brown Swiss, 1,214.	4,403	3.9	171.4	200.9	21.27	1,214	Poor'st
Heaviest Shorthorn, 1,512 ...	4,053	4.3	172.3	202.5	21.82	1,169	Best.
Lightest Shorthorn, 1,061 ...	4,584	3.2	145.0	168.9	17.19	1,446	Poor'st

The heaviest cow in this test weighed 1,512 lbs., the lightest 809 lbs. Here are two cows, one of which weighs approximately twice as much as the other. You that are looking for a big cow that is grand to look upon, listen to me while I report that the heaviest cow made a net profit of \$18.03 in 120 days and the small cow made \$36.41. Here is a case where two cows must be kept to do the work of one. I refer to this at this time to show to you that it is not the size in a cow that enables her to make a profit. Very many cow owners of Wisconsin are fooled by this notion and will not see it in any other way.

Relative standing of individuals in class A.

For the economic production of butter fat and butter.

Entries: 25 Jerseys; 15 Holsteins; 5 Brown Swiss.

Official cow No.	Breed.	Value of products.	Cost of feed.	Net profit.
37	Jersey	\$82.507	\$31.989	\$50.518
39	Jersey	78.139	30.270	47.869
45	Jersey	77.618	30.630	46.988
25	Jersey	75.128	29.048	46.080
20	Holstein	82.590	36.573	46.017
26	Jersey	74.828	29.204	45.624
40	Jersey	73.392	29.167	44.225
21	Jersey	73.841	30.056	43.785
30	Jersey	72.601	29.251	43.350
38	Jersey	72.576	29.339	43.237
43	Jersey	71.674	29.595	42.079
35	Jersey	70.760	28.746	42.014
31	Jersey	70.260	28.471	41.789
22	Jersey	68.806	28.937	39.869
23	Jersey	69.688	29.601	39.787
13	Holstein	74.536	35.232	39.304
42	Jersey	64.184	26.057	38.127
44	Jersey	69.044	31.045	37.999
12	Holstein	71.874	24.165	37.709
33	Jersey	64.209	26.581	37.628
29	Jersey	63.287	26.879	36.408
32	Jersey	61.844	27.384	34.460
15	Holstein	70.028	35.619	34.409
28	Jersey	61.433	27.678	33.755
34	Jersey	61.236	27.739	33.497
27	Jersey	59.136	26.601	32.535
18	Holstein	66.427	34.464	31.963
41	Jersey	59.895	29.334	30.561
8	Holstein	64.667	34.516	30.151
17	Holstein	64.953	34.817	30.136
24	Jersey	57.372	27.689	29.683
6	Holstein	62.469	32.798	29.671
1	Brown Swiss	61.261	33.489	27.772
19	Holstein	61.256	33.956	27.300
36	Jersey	56.950	30.226	26.724
16	Holstein	58.532	33.416	25.116
14	Holstein	57.604	33.571	24.033
4	Brown Swiss	57.823	34.242	23.581
10	Holstein	57.838	34.539	23.299
5	Brown Swiss	58.845	35.574	23.271
9	Holstein	54.861	32.662	22.199
2	Brown Swiss	50.240	28.961	21.279
3	Brown Swiss	51.958	30.205	21.753
11	Holstein	53.911	34.700	19.211
7	Holstein	52.706	34.675	18.031

Relative standing of individuals in class B.

For the economic production of milk for all purposes relative to dairying.

Entries: 25 Jerseys; 25 Shorthorns; 15 Holsteins; 5 Brown Swiss.

Official cow No.	Breed.	Value of products.	Cost of feed.	Net profits.
37	Jersey	899.735	\$31.989	\$67.746
20	Holstein	103.396	36.578	66.823
39	Jersey	93.166	30.270	62.896
45	Jersey	93.394	30.630	62.764
26	Jersey	91.402	29.804	61.598
25	Jersey	90.641	29.048	61.593
40	Jersey	87.735	29.167	58.568
21	Jersey	88.531	30.056	58.495
38	Jersey	87.686	29.339	58.347
30	Jersey	87.195	29.251	57.944
43	Jersey	86.624	29.505	57.029
13	Holstein	92.249	35.232	57.017
35	Jersey	85.414	28.746	56.668
31	Jersey	84.666	28.471	56.195
22	Jersey	84.327	28.987	55.360
12	Holstein	88.688	34.165	54.523
23	Jersey	83.857	29.901	53.956
15	Holstein	88.873	35.619	53.254
44	Jersey	82.884	31.045	51.819
42	Jersey	77.864	26.057	51.807
33	Jersey	76.660	26.581	50.079
29	Jersey	76.190	26.879	49.311
32	Jersey	76.666	27.384	49.282
18	Holstein	83.353	24.464	48.889
8	Holstein	82.859	34.516	48.343
34	Jersey	75.305	27.789	47.506
63	Shorthorn	75.923	28.574	47.349
17	Holstein	82.165	34.817	47.348
11	Holstein	81.218	34.700	46.518
28	Jersey	73.267	27.678	45.589
6	Holstein	78.377	32.798	45.579
1	Brown Swiss	78.648	33.489	45.159
41	Jersey	74.142	29.324	44.806
27	Jersey	70.734	26.691	44.043
24	Jersey	71.641	27.689	43.952
19	Holstein	77.162	33.956	43.206
66	Shorthorn	66.323	24.530	41.793
10	Holstein	75.391	34.539	40.852
5	Brown Swiss	76.352	35.574	40.778
36	Jersey	70.551	30.226	40.325
14	Holstein	73.708	33.571	40.137
16	Holstein	73.338	33.416	39.922
4	Brown Swiss	73.755	34.342	39.513
51	Shorthorn	71.394	33.211	38.183
9	Holstein	70.381	32.662	37.719
65	Shorthorn	61.441	24.004	37.437
68	Shorthorn	62.244	25.444	36.800
74	Shorthorn	60.349	25.473	34.876
2	Brown Swiss	63.032	28.961	34.071
3	Brown Swiss	66.105	32.255	33.900
52	Shorthorn	62.289	28.819	33.470
7	Holstein	67.302	24.675	32.627
72	Shorthorn	57.818	25.254	32.564
46	Shorthorn	61.463	29.756	31.707
56	Shorthorn	58.179	26.911	31.268
60	Shorthorn	58.036	26.953	31.083
73	Shorthorn	57.005	26.256	30.749
47	Shorthorn	58.298	27.816	30.470
54	Shorthorn	55.225	25.048	30.177
46	Shorthorn	60.468	30.883	29.588
69	Shorthorn	56.203	27.008	29.195
58	Shorthorn	56.627	27.699	28.928
57	Shorthorn	55.993	28.770	27.223
59	Shorthorn	53.581	27.802	25.779
71	Shorthorn	54.004	28.638	25.366
64	Shorthorn	50.813	26.598	24.215
50	Shorthorn	53.876	30.086	23.790
53	Shorthorn	47.608	24.509	23.098
70	Shorthorn	44.633	22.792	21.841
48	Died Aug. 14	18.920	11.229	7.691

Herd averages in Class B.

	Jersey.	Holstein.	Brown Swis.	Short-horn.
Average milk per cow; lbs.....	4981.0	6411.3	5301.6	4152.0
Average lbs. milk per cow per day.....	41.5	53.4	44.2	34.6
Average per cent. of fat.....	4.7	3.4	3.6	3.6
Average lbs. fat per cow.....	232.43	219.89	191.56	153.41
Daily average lbs. fat per cow.....	1.936	1.832	1.596	1.279
Average per cent. solids not fat.....	8.8	7.9	8.9	8.6
Average lbs. solids not fat per cow.....	436.096	508.727	470.340	357.556
Daily average lbs. solids not fat per cow.....	3.634	4.239	3.919	2.979
Value fat, per cow.....	\$89.73	\$65.97	\$57.47	\$46.02
Value of daily lbs. fat per cow.....	.58	.55	.48	.38
Value of solids not fat per cow.....	13.08	15.26	14.11	10.72
Value of daily solids not fat per cow.....	.109	.127	.117	.089
Value of total products per cow.....	82.81	81.23	71.58	56.74
Value of daily total products per cow.....	.689	.677	.597	.469
Average cost of feed per cow.....	28.90	34.38	32.89	26.56
Average daily cost of feed per cow.....	.240	.286	.274	.221
Average net profit per cow.....	53.91	46.85	38.69	30.18
Average daily net profit per cow.....	\$0.45	.39	.324	.25

This test should settle these dairy points:

- 1st. Dairy breeds for dairy work.
- 2d. There are profitable cows in all breeds.
- 3d. Selection of cows is of prime importance.
- 4th. Kinds of feed and regularity in feeding and milking are necessary.
- 5th. That a very high yield can be obtained and maintained for a long period.
- 6th. That richness cannot be fed into milk.
- 7th. That there is no art nor science nor cow that can at the same time with the same feed make butter-fat and flesh profitably in both directions.

TEST BROUGHT OUT NEW TREATMENT FOR MILK FEVER.

A discovery of very great value to the dairy world was brought out and demonstrated early in the preliminary work for this test. I refer to the application of oxygen for milk fever. In the Jersey barn 41 cows freshened and 11 were stricken with milk fever and all successfully treated. A number of cases was reported in the other barns and all successfully treated.

This treatment consists in inflating the udder of the sick cow with oxygen, and was first brought to the attention of the dairymen by being used in the Jersey barn at St. Louis. The results of its use there were widely published and dairymen everywhere have tried it with success. This St. Louis test was the occasion that applied and demonstrated the value of this cure and this alone is of far greater value to the dairymen than the total cost of the dairy cow demonstration.

Among the valuable lessons taught by these exhaustive records is the great superiority in economical production of milk and butter by some cows over others which may require nearly the same feed and care. Many people fail to realize what a wonderful animal a cow is.

It is certainly amazing, if a person stops to think of it, that a cow of average capacity secretes in her milk one hundred and thirty-six million fat globules per second, and that a cow giving 8,000 pounds of milk in 120 days, as did one of those at St. Louis, is manufacturing milk at the rate of nearly one and one-half quarts per hour, day and night.

Few investments are accumulating interest at the rate of eight cents an hour as was the case with this cow if her milk is worth 5 cents per quart.

Another feat accomplished by this cow was the production of 903 lbs. of milk solids in 120 days, or about seven and a half pounds of solids, digestible food, every twenty-four hours. Is not that a wonderful performance and does not it increase your respect for a cow?

The cost of feed for this cow was \$36.57, and if the 8,000 lbs. of milk from it is worth five cents a quart its value is \$200. And this was produced in four months. The feed cost for this

cow was \$9.00 per month, making a net profit of \$41.00 per month.

During the 120 days she gave over eight gallons of milk a day, and this contained two and three-fourths pounds of butter per day, which was a great record when it is remembered that she kept it up for so long a time. The feed cost of this butter was eleven cents a pound and her milk less than four cents a gallon.

Another wonderful cow gave during the 120 days 5,800 pounds of milk that contained within one-third of a pound as much butter as the first cow mentioned. The feed cost of a pound of butter from this cow was nine and four-tenths cents. Now this cow made the same amount of butter but it cost \$4 less in feed to make it. She added 77 lbs. to her weight while the other added 54.

The cows in this test came from many states. There was at the St. Louis Fair at one time 41 Jerseys that represented 30 breeders and 17 states. The final selection of 25 Jerseys represented 16 states and 19 breeders. Three Jerseys might be counted as Wisconsin cows. The winning cow was bred by Moore & Gilbert of Muncee, Ind., and was purchased by F. H. Scribner who developed her. She was sold to the writer who owned her at the time the test began, when she was passed to the ownership of W. S. Ladd Est., Portland, Oregon.

The next cow in the test was Diploma's Brown Lassie, bred by Richardson Bros., Davenport, Iowa. She was developed at the Brown Bessie Farm and owned there during the test. She was second best Jersey cow. Wisconsin took a keen interest in this great test and her entries won out with the highest honors.

Only one Jersey bull was shown from Wisconsin, Merry Maiden's Third Son. He won first prize, champion and grand champion. He is herd bull in the Brown Bessie Herd. Of the Holstein breed three cows entered the test from Wisconsin, none of which was near the front. In the show ring Sarcastic Lad won first prize, champion and grand champion prize. This bull was the head of Mr. Gillett's herd for six years.

Wisconsin sent several herds of Guernseys to compete in

show ring, and won many prizes; none, however, was entered in test. Wisconsin Guernseys won many first prizes. First prize aged Guernsey bull was shown by a New York breeder but was bred in Wisconsin. The second prize aged bull was bred and owned by a Wisconsin breeder. Mr. Hill, of Rosendale, bred both of these. Mr. Hill also won first prize and junior champion on yearling bull, as well as first prize for bull calf. No females from Wisconsin were near the front.

Six Wisconsin Short Horn cows were entered in the test, which was one-fourth of the whole number. None of these came near the front.

Mr. Taylor (continuing): Arrangements have been made by which each one of these Jersey cows will have her picture in Hoard's Dairyman. The first prize cow appeared this week; the second prize cow next week, and so on in regular succession until the twenty-five have been shown. On the same page will appear a statement as to the breeding of the cow and a summary of her work while she was down there at St. Louis. So, if you can't wait for the report of this Dairymen's meeting, subscribe for Hoard's Dairyman, and you will get these things.

THE MARATHON COUNTY SCHOOL OF AGRICULTURE AND DOMESTIC ECONOMY.

Prof. R. B. Johns.

In the history of educational work in agriculture, this school occupies a unique place. It is the first of its kind to be opened in America.

The history of the struggles of institutions for the training of young farmers is interesting both in this country and in other countries.

The agricultural college system of the United States dates back to 1862, when the passage through congress of the Morrill Land Grants made the colleges possible. Michigan was the first state to take advantage of this act and establish a college

of agriculture meeting the requirements of the Land Grant Acts. This it did by connecting the new school with one established in 1847. Other states soon followed until at this time there are sixty-four Land Grant Colleges of Agriculture in the United States.

Many schools of agriculture, organized in different ways, had been established before the Morrill Act, the majority of which experienced a precarious existence for a time and then died. Far-sighted and broad-minded statesmen had foreseen the necessity for some method of training the farmer for his work, but it seemed that the difficulties in the pathway of the teacher of agriculture were insurmountable.

The Morrill Grants placed the agricultural college system upon a safe and secure basis; and the benefits derived from the colleges and experiment stations by the great agricultural population of our country are incalculable.

After all this was accomplished and the establishment of the United States Department of Agriculture at Washington, with the added aid of the Farmers' Institutes held in nearly all of the states, it was found that only a very small portion of the fifty-one millions of our people, engaged in some form of agriculture, was reached in a contact so close as to be of the greatest practical benefit to them.

The movement leading to the establishment of County Schools of Agriculture and Domestic Economy in Wisconsin grew out of investigations made by the Hon. L. D. Harvey while acting as the state superintendent of public instruction during the year 1899. In his administration of this office the superintendent made a very thorough examination of the quantity and quality of school training received by the children of the rural population in the state. These investigations showed that the children of the agricultural population were not receiving a fair share of the benefits of a public school system of education, for their preparation in life's work, as compared with other vocations.

The superintendent was now made a commissioner to examine the conditions in other states and in foreign countries, and was required to report to the legislature of 1901 the needs of the rural schools of Wisconsin.

Upon the recommendation of the commissioner two county schools of agriculture were authorized by the legislature of

1901. Marathon county secured one and preparations were immediately made for erecting a building suitable for such a school. A site was selected on the west side of the city of Wausau, containing about seven acres of land, and upon this tract a building was erected at a cost of \$16,500. The two lower floors of this building are devoted to the use of the agricultural school and the third floor to the Teachers' Training School.

The school was opened October 6, 1902, and offers the following courses which were approved by the state superintendent and the dean of the College of Agriculture:

COURSE OF STUDY FOR BOYS.

First Year.

First Term—The Soil, d. 5; Manual Training, Carpentry, d. 5; English, 5; Business Arithmetic, 5.

Second Term—Soils and Fertilizers, d. 5; Manual Training; Carpentry, d. 5; English, 5; Literary Reading, 5.

Third Term—Plant Life, d. 5; Vegetable, Flower and Fruit Gardening, d. 5; Poultry, d. 3; English, 5; Library Reading, 2.

Second Year.

First Term—Plant Life, d. 5; Manual Training, Blacksmithing, d. 5; U. S. History, 5; Economics, d. 3; Library Reading, 5.

Second Term—Animal Husbandry, d. 5; Rural Architecture, d. 5; U. S. History and Civil Government, 5; Library Reading, 5.

Third Term—Animal Husbandry, d. 5; Vegetable, Flower and Fruit Gardening, 5; Economics of Agriculture, 5; Library Reading, 5.

The numerals denote the number of recitations per week; d. denotes double period.

COURSE OF STUDY FOR GIRLS.

First Year.

First Term—Cooking and Sewing, d. 5; Domestic Hygiene, 5; English, 5; Business Arithmetic, 5.

Second Term—Cooking and Sewing, d. 5; Home Economy, 5; English, 5; Library Reading, 5.

Third Term—Cooking and Sewing, d. 5; Vegetable, Flower and Fruit Gardening, d. 5; English, 5; Library Reading, 5.

Second Year.

First Term—Cooking and Sewing, d. 5; Laundry, 4. 3; U. S. History, 5; Library Reading, 5.

Second Term—Cooking and Sewing, d. 5; Chemistry of Foods, 5; U. S. History and Civil Government, 5; Library Reading, 5.

Third Term—Cooking and Millinery, d. 3; Home Nursing, d. 2; Poultry, d. 3; Vegetable, Flower and Fruit Gardening, d. 5; Library Reading, 5.

The numerals denote the number of recitation periods per week; d. signifies double periods.

The complete course covers a period of two years of eight months each.

Under the law as amended by the legislature of 1903, the school receives state aid to the extent of two-thirds of the cost of maintenance, provided that four thousand dollars be the limit paid out of the state treasury to the school in any one year.

The equipment in the way of furniture, library, laboratory apparatus, kitchen utensils, sewing machines, tools and machines for carpentry shop and blacksmith shop have cost about six thousand dollars.

It may not be apart from the purpose of this paper to state briefly the plan and scope of the work attempted, also the place this kind of school is destined to fill in the school system of our state.

Taking up first the character of work done by the young women who attend the school—it is not the purpose or policy of the teacher in the department of domestic economy to turn out a class of girls prepared for the position of hotel cook or sewing girl. Qualifications for these places may come incidentally; but something broader, in increased power to think out the correct solutions of the perplexing problems of the manager of a home, is the result desired of the school's work. Girls who can calculate the cost of a dinner and who can select the

things composing it with an intelligent appreciation of their food values are better qualified to provide for the table of the home than those not so accomplished. Young women who know something of the correct sanitary arrangements of a home make much safer guardians of the health of the family than do those who are ignorant of these things.

The efforts of the school in this department are directed towards making intelligent and contented home makers who are not afraid of the responsibilities involved in cooking a dinner, discussing a poem, patching a torn garment, or entertaining the governor if need be. This kind of girl will adapt herself to any condition in life and will be a useful member of any community.

Under the teacher in this department all students are on the same footing—none are too good to wash dishes and the dignity of honest work is learned.

To the young men who enter the school two lines of shop work are offered, viz., blacksmithing and carpentry. In this work the boys obtain much of practical value in knowledge of how to make articles in every day use at the home. The disciplinary value of this work is not its least advantage. Habits of accuracy, patience and persevering industry are formed, which even in the short period of one term's work become very noticeable.

In the subjects included under agriculture the aim is to teach the elementary principles and successful practices of modern farming. No attempt is made to do original investigation work, the students being too immature for such work and the Experiment Station being organized for just that work. Only those things which have a bearing on local conditions are treated in detail.

In regard to the future of the county agricultural school and the place it will take in our school system, it seems to the writer that it is the only practical solution of the great problem of how to give professional training to the young who are entering upon this greatest of all American industrial pursuits as their life's work.

Doleful and dismal predictions have been made in regard to the county schools of agriculture. Some have said that they would be too small, that no school spirit could be developed, that

no equipment could be secured by a county school board that would be of much value.

All these fears prove to be phantoms, at close range.

Others have advocated the introduction of agricultural courses into our present system of high schools. Trials of this plan would appear to prove it unsatisfactory as the agricultural work usually amounts to nothing more than a study of the former work with a superficial agricultural bias tacked on.

In a state containing 175,000 farms it is hopelessly impossible to expect but a very small proportion of our young farmers to attend the college of agriculture, much as they would be benefited by so doing. In view of these facts, it would appear that the establishment of schools similar to our own at Wausau and its twin at Menomonie, is the only method in which the great rank and file of our young farmers may secure the training in the underlying principles of their business which will insure success in this age of close, even cruel, competition.

DISCUSSION.

Ex-Gov. Hoard: Do you think that the seven acres that you have allowed there can be so arranged as to furnish sufficient ground to carry out demonstration work, what you want to teach in the botany of the farm, and wouldn't it be an advantage to have some facilities for studying animal husbandry?

Prof. Johns: I believe that the law requires that not less than three acres shall be attached to schools of this kind. For garden work, horticultural work, that probably would be sufficient, but of course for farm crops the farm would be a very limited one. Now, as to the other question, we have here in Marathon county for teaching stock work better facilities, I may say, than almost any other county in the state. We have representatives of eight different breeds of cattle here and a number of fine flocks of pure bred sheep and swine, and we take our boys from the school in the afternoon and ride out to those farms. We take the whole class out to the farm, and there view the animals and go over the points as they stand before the class, and that gives us an opportunity also to see some of

the best equipped barns in the state, and the boys study the arrangements of these farms, buildings, etc. Some of these men have spent a great deal of money in their equipment and in the selection of their herds, and we probably can do pretty nearly as good work by going out on these farms.

Ex-Gov. Hoard: This is a very practical way of getting at it. Almost every county in the state has some cattle farms and many of them have them connected with the poor house and asylums. Could it not be possible that in some way, not having the school too close, that the county could utilize those farms for the instruction of such a school, the carrying on and conducting of the county farm?

Prof. Johns: I think that that is done at Menomonie. I think that the school over there has the use of the Fair Grounds, so that they have practically a farm in connection with their schools. We have the asylum farm and the poor farm within two miles of the city, and also the Fair Grounds within a quarter of a mile.

Ex-Gov. Hoard: These boys stand in the same position that I stood as a boy. It would have been a great advantage to me if I could have been taken and shown by the object and the eye some of these things, for instance, the difference in the characteristics of animals, why the Ayrshire is as she is, the Jersey as she is, the the Short Horn as she is, and I could also have been shown something in regard to stable management, all these things that come up now, but when I was a boy were almost unknown. The boy stands today on the shoulders of the generation that is ahead of him. What we learn when we are boys stays with us. What we learn when we are men maybe stays with us and maybe it doesn't, but it seems to me it would be a great advantage if in every county in this state there could be this organization of the farm judgment and the farm intellect and the farm conscience and the farm heart of its people, for the promotion of this desirable knowledge among the farm children, and I am glad to record here my gratefulness to Marathon county. I feel grateful to Marathon county that she has moved out onto this field, taken possession of it and has shown to the rest of us in the state what can be done and what we may hope to do for ourselves.

Mr. Quaw: The greatest advantage of schools of this kind is in looking over the boys and remembering that not one per cent of them will go into the Agricultural College. Here the boy can go to the Agricultural School because it is near home, at a nominal expense, and they can get a good deal that they never can hope to get by going to the Agricultural College.

POSSIBILITIES OF THE CHEESE INDUSTRY IN WISCONSIN.

E. L. Aderhold, Neenah.

The possibilities of the cheese industry of Wisconsin are hinged on 1. The increase in the demand for cheese. 2. Wisconsin's advantages in producing and distributing cheese. 3. The reputation of Wisconsin cheese.

DEMAND.

The demand for cheese, home and foreign, is probably somewhat in excess of 300,000,000 pounds a year.

It is believed that the per capita consumption at home does not exceed an ounce a week, or three and one-fourth pounds per year. On that basis a population of 80,000,000 people would consume 260,000,000 pounds annually.

From these figures it is apparent that this country has a large number of cheese "nibblers" but comparatively few cheese eaters.

The demand should grow from two causes. 1. Increase in the population and, 2, increase in the per capita consumption.

Prof. R. A. Pearson, while connected with the Department of Agriculture at Washington, stated at a cheesemakers' convention that the per capita consumption could and should be doubled, but made no estimate as to the time required for doing it.

I would not attempt to estimate what the rate of increase will be but will say it will depend largely on the character of the goods we place before the consumers.

Applying the per capita consumption given above to the average increase in the population of this country gives an increase in the consumption of between 4,000,000 and 5,000,000 pounds per year, or nearly half a million dollars worth. While the home demand, in recent years, has been rather lively and is showing a healthy growth it appears as though it should grow faster when we consider how small the per capita consumption is. However, there can be no question but that, for many years to come, there will be a steady growth in the demand.

PRODUCTION AND DISTRIBUTION.

From whence will come the supply for this increase in the demand? Aside from Wisconsin the states having the greatest pretensions as cheese producers are New York and Ohio. Next come Pennsylvania, Michigan, Minnesota and Iowa.

In the three last named states there is a strong leaning towards buttermaking. In the east also an appreciable proportion of the milk supply is, and will be, manufactured into butter and the demands on the milk supply by the big city population and by the condensing factories are so enormous as to actually divert milk away from cheese factories. So, in all the above named states the cheese industry is really not growing.

As to Wisconsin I will say that the leaning is equally strong towards the cheese industry as it is towards the butter industry; that our accessibility to the southern and western markets is equal to that of any state in the "cheese belt;" that we have a fertile soil where good water is plentiful; that we have sufficient rainfall and a scarcity of droughts; that we have a temperate climate with cool nights; that we grow abundant crops of red top, blue grass, corn, clovers and cheesemakers.

With this ideal combination of conditions it appears as though Wisconsin can, and should, take care of the lion's share of the increase in the trade because this can be done without encroaching on any other established industry, for, as the north half of the state develops there will be found room for several thousand cheese factories.

REPUTATION OF WISCONSIN CHEESE.

In conclusion I will state that when our milk producers will have provided their cows with stables that are healthful and sanitary; when they have been persuaded to *practice* cleanliness in milking; when factory operators who accept dirty milk will be rare instead of in the majority; when we can step into our factories and find, as a rule, vats full of milk that is normal and can be made into clean flavored cheese; when the consuming public is assured that Wisconsin cheese is made from clean milk and in clean factories, then, I venture to predict, the demand for our cheese will grow as rapidly as we can supply it and our most ardent hopes regarding the "Possibilities of the Cheese Industry of Wisconsin" will be realized.

DISCUSSION.

The Chairman: Some of us got the habit of thinking years ago that Sheboygan county must produce the cheese of this state, or Richland county should produce it, but the fact is Northern Wisconsin is coming into the field largely.

Ex-Gov. Hoard: From your experience, does the cheese improve in quality the further north you go in the state?

Mr. Aderhold: No, I really can't say that. The milk is a little richer up here than it is further south, as a rule, but it depends more upon how clean the milk has been and how it has been handled than anything else.

Ex-Gov. Hoard: But supposing the milk is equal in cleanliness and handled equally skillfully, do you think there is any advantage in the cooler summer?

Mr. Aderhold: Yes, there is, in the cooler nights. We can keep our temperature in the curing room better than if the nights were warmer. Of course, there is another advantage up here because of the clover growing so persistently, and the tame grasses, which they have not further south, and up here we are not troubled with droughts as they are further south.

Mr. Everett: Is the water any better up here?

Mr. Aderhold: It is better than in many places. I notice the land is usually sloping and there is no stagnant water to be found in this country. In some places there are ponds. I should consider it an ideal cheese country up here, because of the grasses and the country being well watered and the nights cool. There is no earthly reason why you can't make the finest kind of cheese if you will only learn to practice cleanliness.

Ex-Gov. Hoard: Is it more important to have clean, sweet milk in cheese making than it is in butter making?

Mr. Aderhold: I think the imperfections in milk will cause more trouble in cheesemaking than in buttermaking, but it is very important in both cases to have clean milk. Now, I believe for more reasons than one that the cheese industry is always going to be a good one as compared with other industries. Some of our farmers thought last summer that the cheese industry was running down, because for a few months the prices were a little low, the demand was a little dull. But there were a number of circumstances that combined to cause that. In the first place, there was a little change in the times last year in February, and the demand fell a good deal short of what it was expected to be. Then the presidential campaign was on, you know, and that always has something to do with upsetting business a little. Another condition was that for the first four months last year, we had more milk than we ever had for the same number of months in years previously, and we made more cheese. And there is one more circumstance that helped to depress the business and that was that a great many of the dealers had stocked up on very highpriced cheese the year before and "got it in the neck" and they wanted to get some of that money back,—and they did, too. But when the market became cleaned up, along in August and September, prices went up the same as they had been and they have been up ever since. They are now in the neighborhood of 12 cents, which is certainly very high. Now, we must not, because we have it a little dull for a few months now and then, come to the conclusion that it is always going to be that way. We have the same thing with other products that we produce, and if we are going

to quit raising pork or oats or mutton or beef or corn, because once in a while the market happens to be dull, there wouldn't be anything left for us to raise. I believe that the outlook for cheese is a little better with us than for any of the common products of the farm, because, in the first place, in those states outside of the cheese belt, it is not likely there is going to be very much cheese produced in the future, and, as I stated, there are only two or three states inside the cheese belt that are likely to be big cheese producers, and with the population growing all the time and the demand for cheese growing with it, it seems to me that the cheese business always will be very profitable for a great many years to come.

Mr. Emery: You did not mention the competition of Canada.

Mr. Aderhold: Well, there is a duty on Canadian cheese.

Mr. Moore: Is it not a fact that New York state is liable to go back in the manufacture of cheese on account of the enormous amount of milk consumed?

Mr. Aderhold: Yes, the city of New York demands so much milk that they are encroaching on the cheese industry. There is another consideration in connection with this question whether the cheese business will be profitable, and that is this, the production of milk is not increasing as fast as the population, and of course the population makes the demand for dairy products. For that reason, I think not only cheese, but all dairy products, will be profitable to engage in.

Ex-Gov. Hoard: There is another thing about the cheese-producing sections in New York state; the land there is not producing more than about half the feed it did forty years ago, and that is reducing the product of cheese per acre.

Secy. Burchard: And there is another proposition in connection with this matter, and that is the relative price of cheese in Wisconsin as compared with some other markets, New York and Canada, if you please.

Mr. Aderhold: I think the markets here average higher than they do in those places, though I have not kept close track of those figures. Of course, I read the reports from week to week and I believe that our cheese prices on the average are higher than they are in New York and Canada. I suppose one

reason for it is that we have better methods of selling our cheese, what they call the auction board. That has something to do with it.

Ex-Gov. Hoard: Then we have a great home demand.

Mr. Aderhold: We are closer to the southern and western markets than some of the other states are.

Ex-Gov. Hoard: They have to pay six cents a pound to get to our market.

Secy. Burchard: And there is one other item, that is, for the present or the recent past, we have saved to the farmers the toll that one set of middlemen take, haven't we, by not shipping to New York?

Mr. Aderhold: Yes, that is true. Of course, by having a home market for practically all our cheese, it cuts out one commission.

Mr. Emery: Is it true that the quality of Wisconsin cheese is such as to displace largely the New York cheese in the southern market?

Mr. Aderhold: Possibly so, but it is not because they could not make cheese to suit the southern market.

Ex-Gov. Hoard: The railroad freights are what have been playing hob with us in that particular. New York could put cheese in that country for a quarter of a cent less than we do.

Mr. Emery: Nevertheless our cheese supplies a large part of that market.

President Hill: The hour has come to close the convention, and I want to say just a word. I am sure we have appreciated the opportunity of being with you, and I think as the years go by, you will appreciate more and more that it has been profitable for the convention to come here.

You have listened to words spoken by these well known dairymen, men who have been successful in the business and I think you will feel as I do, that I owe a debt of gratitude to them for any success that may ever come to me, and I want you to realize that they do this unselfishly, that while in the same lines of business, if a man is successful, he often wishes to keep to himself the knowledge of the elements of his success, but these dairymen are certainly not like that. They have come here with dairy knowledge and we have been very kindly

received by you. We shall take away with us very pleasant remembrances of our visit at this time.

If there are no other matters of business, this convention will stand adjourned. Again, we thank you.

Mr. Loomis being unable to attend the convention forwarded his annual report as treasurer, to the secretary later and it is hereto appended,

TREASURER'S REPORT, 1904.

Mr. President and Members of the Association: The following itemized report is made showing the source from which all monies paid into the Treasurer's hands were received and the disbursements paid on orders from the Secretary, which I hold as vouchers.

Receipts.

1904.

Feb. 19.	Balance in hands of treasurer.....	\$494 56	
	Memberships for 1904	238 00	
May 14.	Received from state treasurer	2,000 00	
Nov. 22.	Received from state treasurer	2,000 00	
			<hr/>
			\$4,732 56

Disbursements.

1904.

Feb. 23.	H. K. Loomis, moneys advanced, expenses, Platteville convention	\$248 45
24.	Premiums awarded at Platteville....	196 40
26.	C. H. Everett, expense attending Platteville convention	8 45
	C. P. Goodrich, expense attending Platteville convention	6 15
	U. S. Baer, expense attending Platteville convention	3 60
	J. Q. Emery, expense attending Platteville convention	3 85
	J. R. Danks, expense attending Platteville convention	3 60
	Chas. L. Hill, expense attending Platteville convention	8 15
Apr. 6.	W. A. Henry, expense attending Platteville convention	4 60
	H. L. Russell, expense attending Platteville convention	3 75
	J. G. Moore, expense attending Platteville convention	3 85
	E. L. Aderhold, instructor, Platteville convention	64 50
20.	Mrs. A. L. Kelly, report	111 54

May	21.	E. L. Aderhold, instructor.....	129 00	
		N. E. France, expense Grant Co. cow census	8 00	
June	8.	E. L. Aderhold, instructor	147 00	
		Fred Marty, instructor	145 00	
July	8.	E. L. Aderhold, instructor	143 00	
		Fred Marty, instructor	139 00	
		T. Corneliuson, instructor	70 00	
Aug.	5.	E. L. Aderhold, instructor	121 50	
		T. Corneliuson, instructor	125 00	
		Fred Marty, instructor	135 00	
Sept.	6.	E. L. Aderhold, instructor	151 00	
		T. Corneliuson, instructor	118 00	
		Fred Marty, instructor	115 00	
Oct.	11.	E. L. Aderhold, instructor	137 00	
		T. Corneliuson, instructor	115 00	
		Fred Marty, instructor	115 00	
		John Luchsinger, sundry expenses...	15 80	
Nov.	5.	E. L. Aderhold, instructor	129 50	
		T. Corneliuson, instructor	107 00	
Dec.	6.	Fred Marty, instructor	10 00	
		E. L. Aderhold, instructor	64 50	
		T. Corneliuson, instructor	111 00	
1905.				
Jan.	23.	Fred Marty, instructor	130 00	
		T. Corneliuson, instructor	110 00	
Feb.	3.	T. Corneliuson, instructor	120 00	
	20.	W. D. Hoard, printing	26 10	
		Geo. W. Burchard, salary as secre- tary, etc.	303 37	
		Balance in hands of treasurer.....	1,024 60	
				<hr/>
				\$4,732 56

Approved September 22, 1905.

J. O. DAVIDSON,
Acting Governor.

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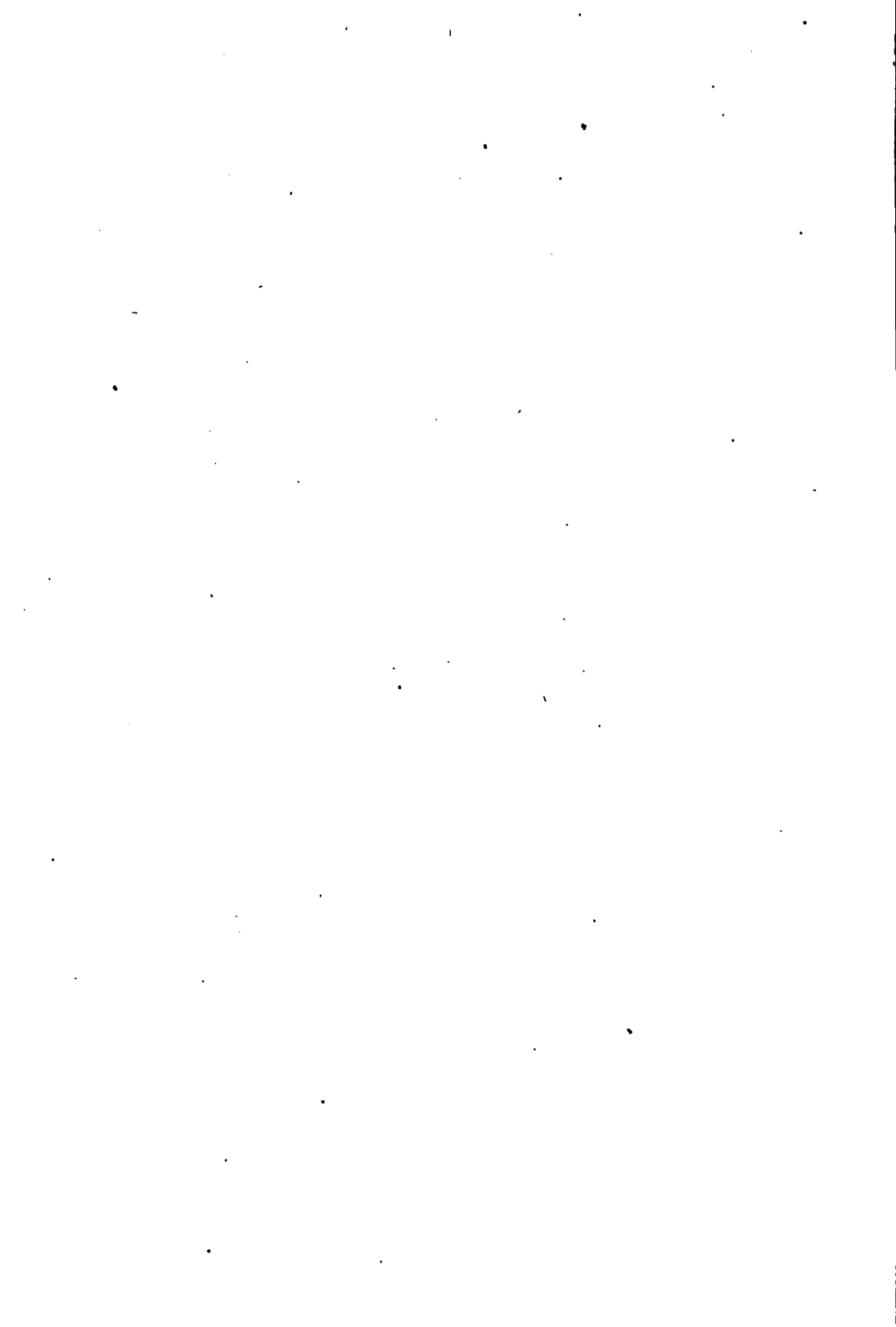












THIRTY-FOURTH ANNUAL REPORT
OF THE
WISCONSIN
Dairymen's Association

HELD AT

Waukesha, Wis., January 31, February 1 and 2, 1905.

REPORT OF THE PROCEEDINGS, ANNUAL ADDRESS OF THE
PRESIDENT, AND INTERESTING ESSAYS AND DISCUS-
SIONS RELATING TO THE DAIRY INTERESTS.

COMPILED BY

GEO. W. BURCHARD, Secretary.

MRS. A. L. KELLY, Stenographic Reporter.



MADISON, WIS.,
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1906.

LETTER OF TRANSMITTAL-

WISCONSIN DAIRYMEN'S ASSOCIATION,

Secretary's Office,

FORT ATKINSON, June 13, 1906.

To His Excellency, JAMES O. DAVIDSON,

Governor of the State of Wisconsin.

I have the honor to submit for publication, as provided by law, the thirty-fourth Annual Report of the Wisconsin Dairymen's Association showing the Receipts and Disbursements the past year, also papers relating to the dairy interests read and discussions had at the annual convention held at Waukesha.

Very respectfully,

GEO. W. BURCHARD,

Secretary.

OFFICERS, 1906.

PRESIDENT,

W. J. GILLETT,

ROSENDALE, FOND DU LAC COUNTY.

VICE PRESIDENTS,

HON. A. D. DELAND, SHEBOYGAN, SHEBOYGAN COUNTY,

President 1877.

HON. STEPHEN FAVILL, MADISON, DANE COUNTY,

President 1880.

HON. H. C. ADAMS, MADISON, DANE COUNTY,

President 1887-9.

PROF. W. A. HENRY, MADISON, DANE COUNTY,

President 1890.

HON. W. D. HOARD, FORT ATKINSON, JEFFERSON COUNTY,

President 1891-3.

HON. C. H. EVERETT, RACINE, RACINE COUNTY,

President 1894-5.

HON. H. C. TAYLOR, ORFORDVILLE, ROCK COUNTY,

President 1898-9.

HON. C. P. GOODRICH, FORT ATKINSON, WIS.,

President 1900-01.

HON. J. Q. EMERY, ALBION, WIS.,

President 1902-03.

CHARLES, L. NEILL, ROSENDALE, FOND DU LAC COUNTY.,

President 1904-05.

SECRETARY,

G. W. BURCHARD,

FORT ATKINSON, JEFFERSON COUNTY.

TREASURER,

H. K. LOOMIS,

SHEBOYGAN FALLS, SHEBOYGAN COUNTY.

HON. CHESTER HAZEN, RIPON, FOND DU LAC COUNTY,

President 1872-74. Died 1900.

HON. HIRAM SMITH, SHEBOYGAN COUNTY,

President 1875-76. Died May 15, 1890.

HON. H. F. DOUSMAN, WAUKESHA COUNTY,

President 1878.

HON. Z. G. SIMMONS, KENOSHA COUNTY,

President 1879.

HON. C. R. BEACH, WALWORTH COUNTY,

President 1881-82. Died September 15, 1898.

HON. W. H. MORRISON, WALWORTH COUNTY,

President 1883-86. Died December 15, 1893.

ARTICLES OF ASSOCIATION

(Adopted February 15, 1872.)

ARTICLE I. The name of this organization shall be, the Wisconsin Dairymen's Association.

ARTICLE II. The officers of this association shall consist of a president, secretary and treasurer.

ARTICLE III. The vice presidents of the association shall consist of all past presidents.

ARTICLE IV. The president, vice presidents, secretary and treasurer shall constitute the executive board of the association.

ARTICLE V. The officers of the association shall be elected at the annual meeting and shall retain their offices until their successors are chosen.

ARTICLE VI. The regular annual meeting of the association shall be

held each year, at such place as the executive board shall designate.

ARTICLE VII. Any person may become a member of this association and be entitled to all its benefits, by the annual payment of one dollar.

ARTICLE VIII. The executive board shall have power to call special meetings whenever and at such place as in their judgment its interests so demand.

ARTICLE IX. The officers of the association shall perform such other duties as usually devolve upon the officers of like associations.

ARTICLE X. The treasurer shall have the custody of all moneys belonging to the association, and authority to pay out the same whenever an order is presented, signed by the president and secretary.

TRANSACTIONS
WITH
ACCOMPANYING PAPERS AND DISCUSSIONS
OF THE
Wisconsin Dairymen's Association
AT THEIR
THIRTY-FOURTH ANNUAL CONVENTION

Held in Waukesha, January 31, and February 1 and 2, 1906.

President Charles L. Hill in the chair.

The Chairman: The Association will please be in order. Although there are but few here, it is past the time that is set for the proceedings to commence. I am particular in regard to promptness, and I will say to you that hereafter the sessions will commence at the hour set by the program, if the chairs are here. The first number on our program is the address of welcome by his Honor, Mayor Snyder, of this city.

ADDRESS OF WELCOME.

By Mayor M. L. Snyder.

Mr. Chairman, Members of the Wisconsin Dairymen's Association, Ladies and Gentlemen: I deem it a privilege and an

honor and withal a pleasant duty to extend to you a cordial greeting and a hearty welcome to the city of Waukesha.

The selection of this city as the place of meeting of an organization composed of intelligent and advanced workers in a profession so closely allied with what may be termed a higher branch of agriculture is a compliment highly appreciated by all our people.

It cannot be gainsaid that since the development of the dairy interests the farmer has prospered and many thousands have thereby been enabled to pay off their mortgage indebtedness, and to surround themselves with comforts and privileges theretofore unknown. A day's ride about Waukesha county will convince the most skeptical of the truthfulness of this statement, viz.: where the cheese factory and creamery are most numerous there you will see evidences of greater prosperity. The fine, yes, I may say elegant, dwellings, capacious barns and stables with barn-yards containing herds of cows and stock that affords pleasure to look upon.

In the daily press a few days ago I noticed a statement from Vernon county, Wis., to the effect that a dividend of 200% on a capital stock of \$3,700 was paid the Viroqua Creamery Asso., a splendid profit indeed.

Your work as an organization commenced thirty-four years ago and from a very small beginning you have now developed 2,000 well equipped and prosperous cheese factories and more than 1,000 creameries, whose products are "fit for a king." I am told that the annual product of the dairy in this state has reached the enormous sum of \$50,000,000 and that 1,000,000 cows give the milk, rich with cream, to help make up this great sum. Thus we may indeed say: Among the choicest blessings God gives to man is the pure and wholesome product of the dairy which not only insures prosperity but health and longevity. Especially would this be the case if at all times those engaged in your line of business would do like another branch of agriculture located in this city, whose product "Is not touched by human hands and washed and cleansed by pure Waukesha spring water."

Wisconsin ranks first in the number of cheese and butter factories in the union and took first prize on its cheese at the Centennial Exposition in 1876. At the St. Louis Exposition, Wis-

consin took the lead over all competitors. Truly a record to be proud of and a condition undoubtedly largely due to the interchange of thought and the experiences and lessons gained and profited by at these, your annual conventions.

A word as to our city—The city of Waukesha has now a population of 7,000. Among its industries may be mentioned, The Modern Steel Structural Co., the Waukesha Malleable Iron Works, the Waukesha Canning Co., the Wilbur Co's Factory, the Wisconsin Butter and Cheese Co.; and last but not least, the several spring water companies, whose pure and medicinal product is recognized and finds a ready market in every civilized country on earth and insures a return to the owners of many hundred thousand dollars annually. Our schools rank among the best in the state, with an attendance of 1,700 pupils and a corps of teachers whose assiduous work is characterized and rewarded with commendable success. Carroll College also located in one of the beautiful portions of our city affords an opportunity for higher education not excelled any where. Its future stability and success is assured by recent munificent donations, and with the completion of plans well under way, its facilities for the accommodation of students will be greatly enhanced.

The many handsome churches in our city, speak louder than words of the moral and religious tendency of our people. They are presided over by a clergy, intellectually the peer of any in the state. The two national banks located here have deposits of nearly three millions of dollars and taken together with the other banks located in the county, shows their total resources to be \$4,500,000. This gives evidence of the financial standing of this community and county, to which I may add the agriculturist contributes a very large percentage. The population of Waukesha county being 34,000 there is a per capita of \$135 for every man, woman and child in the county in the banks alone.

Gentlemen, you have met at this annual convention for the purpose of an exchange of mutual felicitations and the gaining of knowledge and the consequent improvement in your profession which the discussions led by able exponents of the dairy interest are sure to produce.

May your stay in this city be fraught with much pleasure. I again extend to you a hearty welcome.

The Chairman: Secretary Burchard will respond.

RESPONSE.

Secretary Burchard: That is what I call a snap. I don't exactly know whether I shall be able to get out of the trap without the loss of a limb, or some minor member. It is not my place to respond to addresses of welcome, Mr. President, that is your business, and you ought to have attended to it yourself. However, (if I have your permission), I can say, for myself and for the Association, that we are mighty glad to be welcomed to Waukesha. We wanted to come, and I don't know what inducements were held out in order to secure the invitation to come, and perhaps it is better that nobody should know. All the same, we are glad to come, and we are very glad to be welcomed with such kindly words as the mayor has seen fit to use.

This is not my first visit to Waukesha, nor my first welcome to Waukesha either, so far as I am individually concerned. More years ago than I care to admit, certainly it was a decade or more, I came to Waukesha. This was before the flood,—I mean, this flood of "spring water" that is not only running all over Waukesha, but all over the country as well. There were a lot of good people here, and they extended to me as a boy a very nice and much appreciated welcome. It was not altogether in bed and board, but they took me to their hearts, they encouraged me, they entertained me with their stories of the earlier days, when the Pottawattomies were the principal inhabitants here, and, what perhaps is more to the purpose, they overlooked many of my boyish pranks and misdoings, and I trust that those who have succeeded those older people, (I mean those people that were here in the early days), will be as kind to the Association as those people were to me; that they will overlook whatever may be amiss in our programme or in our proceedings; that they will treat us with generous hearts; try to believe, at least, that we mean to be fairly good and respectable; that we mean to do about the fair thing, and that we are not here to put on style or pretend that we are wiser than the Waukesha people, but that we have met here to confer with them, that we want to receive as well as to give.

I want to say about this morning's meeting, that starting off a convention is a good deal like starting a train of cars; it goes very slowly at first, but, as a rule, the longer it runs the swifter it goes, and the better; and I shall be indeed very much disappointed if we do not have a good convention. I hope there will be a good attendance this afternoon. This is really going to be the best afternoon of the whole series, that is, we will say it is the best, anyway until it gets to tomorrow, and then we will promise better things. But it is going to be a good afternoon, a very important afternoon for every man who keeps cows, at least for them who keep cows for profit. There is going to be a very interesting meeting this evening, it is a general meeting, we are not going to talk very much about cows, we are going to show to the people of Waukesha, especially to the city people of Waukesha, that farmers have some interests in common with them, that they can consider the same subjects that appeal to the city dweller, that they are interested in and not altogether ignorant concerning them. I would like to have those who are present here this morning, if they are on the streets and elsewhere, say to the people of Waukesha that Mrs. Emery, who is to address us this evening, is a very talented woman. She has had wide experience in educational matters and more recently on the farm. She is a sort of model farmer's wife now, and we would like to show the people of Waukesha what a model farmer's wife can say and do, and how she can appear in public.

Coming back to Waukesha, however, is a sort of serious matter with me. I miss the familiar faces. If it were not for the fact that I hear once in a while the name of Clark Hartwell or Bill Hardy or Dick Gove, I do not know whether I should recognize that this is the Waukesha of my early days. I do see, now and then, a monument of the early days, they look a little out of place now in connection with more modern structures, but they bring up many happy recollections to me of the boys and the girls that used to live in those houses, that were my schoolmates, playmates and associates. And then, when I see that strangers are occupying those residences, when I see in the papers and the advertisements so few names that used to fill the papers, I begin to feel that I am growing to be nearly "the last leaf upon the tree," and I say to myself, "Where are the friends that to me were so dear, Long, long ago, long ago?"

These are perhaps not very appropriate words in which to respond to an address of welcome, but they are the thoughts that come to me, and perhaps it will suffice for me to say that the Association is very glad indeed to be welcomed to Waukesha, and the mayor has our sincere thanks for the kindly words in which that welcome has been expressed.

Vice-President C. P. Goodrich was called to the chair.

PRESIDENT'S ANNUAL ADDRESS.

In looking over the annual reports of this Association, of which I have a set complete since 1883, I am greatly impressed with the unselfish endeavor exerted in all these years by its founders, for the upbuilding of the dairy industry.

In the 34 years that have elapsed since its organization, they have seen the annual production of butter grow from 22 million pounds to 125 million pounds; and the cheese from 3 million pounds to 85 million pounds, and it can almost be said that even now the dairy industry is but in its infancy, for not only in those portions of the state where new territory is being opened up but also in the older portions of the state the interest in dairying is ever on the increase.

It has been universally true I think that wherever this Association has held its meetings there has been a great awakening along dairy lines.

It will be remembered by those who attended the meeting at Wausau last year that on account of the farmers in that new wooded country being so busy hauling forest products that the attendance was not what we had hoped it would be.

But in spite of this the interest in the meetings was well sustained and Mr. Wright has written me three times during the year, telling of some man or men who went home from that meeting with inspiration and enthusiasm that has resulted in new barns, new silos, better dairy stock, cleaner milk and more of it.

The final results of such seed sown is beyond estimation.

Such results must bring to those "who have borne the burden and heat of the day" a feeling of great satisfaction.

The past two or three wet years have caused a little lull in the opening up of our northern timber lands and an increased immigration to the great grain fields of the Northwest, but as former experience has proven, two or three dry years will send these same farmers back to Wisconsin to settle down to dairying. Heat or cold, wet or dry, the old brindle cow continues to be the great wealth producer.

Our meeting this year, here at Waukesha, is in that section of the state where a large part of the milk produced, is used for city consumption, and I hope the influence of this convention will come as a warning, for those sections of the country where this branch of dairying has been followed have not been those that are the most prosperous for a term of years.

This need not be true, and the constant aim should be to maintain the fertility of the soil.

We should profit by the example of some of the eastern states.

In the October issue of "Country Life in America" there is an article entitled, "A state for sale at \$10.00 per acre," giving the agricultural experience of New Hampshire where whole communities are abandoned.

Results have proven that these same farms, exhausted as they are, can by dairying, and careful conserving of fertility, be once more restored to their original state of fertility.

About 12 years ago the price of farm lands in New York fell 50% or more, and while a large part of the land in that state is still for sale at these lower prices, those farms that are near town or the trolley lines are coming back in price largely on account of the ready market for dairy products at good prices.

I am pleased that so much of our time at this meeting is to be given up to the discussion of alfalfa and its culture, for I am more certain each year that its culture means much to Wisconsin agriculture.

Prof. Moore in his studies of alfalfa has concluded that Waukesha county is peculiarly adapted to the production of alfalfa, and each year will witness a great increase in its cultivation not only in Waukesha county, but in nearly every part of the state.

It was my privilege in January to visit for three days around Syracuse and Fayetteville in Central New York, and the price

of farm land there now is largely influenced by its ability to grow alfalfa.

Many matters of importance to the dairy industry of this state have come up this past year.

One of these is the enactment of the law requiring cattle brought into this state to be tuberculin tested.

With this testing in charge of our Live Stock Sanitary Board, only good will come from the enforcement of this law.

Another is the National Dairy Show to be held at Chicago, Feb. 15th to 24th, 1906.

While it will be impossible to make this show in many particulars a model one the first year, its success is assured and it will from the very first be a great educator, not only of the dairymen who will visit it but of the city consumers of dairy products.

The report of this Association for 1883 contains a report of the Grand Union Dairy Fair held Dec. 4-9, 1882, and though it was a financial failure on account of cold stormy weather, still I am surprised that being so great a success in other ways, that a like venture should not have been tried again until 23 years had elapsed.

I note that one of the prizes at that show was for "The youngest cow with calf by her side, but no dairy show today would offer such a prize, showing an advance of dairy thought.

I hope a large delegation from Wisconsin will attend the show at Chicago next week.

Still a third thing worthy of note is the official year fat record of the cow Yeksa Sunbeam, owned by Mr. Fred Rietbrock, and kept on his farm at Athens, Wis.

Her record of 857.15 lbs. of fat seems almost incredible, but larger records, as well as growth along all other lines, may be looked for.

No other cow is known to have produced as much fat in a year.

This, following the winning in 1904 of the dairy test at St. Louis by Loretta D., a cow that went from Wisconsin, will do much in bringing Wisconsin pure bred dairy cattle into even greater prominence than they now possess.

Already bulls bred in Wisconsin stand at the head of pure bred herds in nearly every state, if not every state of the union.

The subject of raising cows and heifers for market is on our

program at this meeting, and nearly all the breeders of pure bred dairy cattle will testify to the increasing demand both in this state, and from outside as well, for both cows and heifers.

I have had calls this year from California on the west to the District of Columbia on the east. I bespeak a careful study of this subject.

Since the last meeting of this Association the legislature has passed the law giving the State Dairy and Food Commission a second assistant commissioner, an assistant chemist, and eight additional inspectors, and anyone who has been carefully following the work of this commission this year will not hesitate to say that this work is all that we hoped it would be in its improvement in the quality of the dairy products produced in our state.

I was much impressed by the exhibit made by this commission at our last state fair, and the crowds constantly in attendance showed that the exhibit was of interest and profit to all.

The other new laws relating to the adulteration and sale of food and dairy products will make the commission much more effective.

In closing I want to speak of the bright outlook for Wisconsin dairying.

With the ever increasing market, caused by the growth of St. Paul, Minneapolis, Chicago, Milwaukee and the cities of northern Michigan, and the nearness to the great feed bins of the northwest, dairying is bound to be Wisconsin's leading industry.

In the words of the Norwegian farmer, we must "Just keep a pullin' titts."

"Pullin' Titts."

Aye ban a yust gude farmer for more as saxteen yare,
Aye raise some wheat and corn, and fat some hogs and steer,
Aye watch that farmer business close, for where that money gits,
And Aye find it koming kwichest when you ban a pullin titts..

Dam falla what ban raising grain, and hauling dam to town,
Hay got no money in the pocket, hay ban broke the whole yare
round,

Dam falla what ban fattening stock, ban rich and dan ban poore,
Some time day make a plenty money, some time day loosin more.

But dam falla wid da brindle cow, he got bully ting, you bet;
Hay never lose hims whole yare crop, if groun been dry, or ban
too wet,

Ven hail ban strikin down the crop, and yust ban raisin fitts,
At night ha call dem brindles in, and yust ban pullin titts.

Hay got dam separator what makes a lot of cream,
Hay got da money coming in yust like a pleasant dream,
Hay got a money in di bank, hay got a money in his mitts,
Hay ban no Rockafellow, hay yust ban a pullin titts.

The Chairman: I believe it has been the custom to appoint a committee on the President's Address. Just what that committee's duty is, I do not know, but I believe to draw up a resolution commenting on the address, or criticising it, or something of that kind. At any rate, I will appoint a committee, and I will appoint A. J. Glover, Mr. O. P. Clinton and Mr. S. E. Geron.

The President resumes the chair.

The Chairman: We have nothing else on the programme this morning, but I am sure you are not wishing to go home just yet and we have with us a number of Wisconsin's best known dairymen, and men who are not on the programme, and while I am sure they will take part in discussions, you will want to know them better, thus early in the proceedings, and I am going to call for a few words, first from Mr. C. H. Everett of Racine, who is one of the ex-presidents of this Association, and the editor of the Wisconsin Agriculturist, which I doubt not is in many of your homes, and you will be glad to meet and know Mr. Everett.

GENERAL GREETINGS.

Mr. C. H. Everett, Racine, Wis.

Mr. President and Gentlemen of the Convention: I have just this moment entered the hall and I do not know what has been said or done here this morning. I came in time to hear the close of the president's address. I do not know what I am expected to say to you, I do not believe that I can say anything of very great value. I am out of the field of lecturing, I have quit talking and have begun to write within the last few years. However, I have been in this field of dairying for a good many years, personally engaged in it, "just pulling teats," and I found it profitable business; I made a little money dairying, I managed to take care of part of it, enough to keep me out of the poor-house for sometime to come. I don't know why I ever quit the business of dairying. I don't know why any man should ever cease to do business with a good dairy cow. I don't know of any business in the world more profitable, which makes a man more independent, than that of dairying.

I see before me in this room men who have grown gray in the business, men who may be considered well off, rich, who do not owe anybody a dollar and have plenty to take care of them; they do not do much now, they have ceased to work, cows have made them well off. But those men have been good dairymen, they have been students of the dairy cow, and have learned the dairy business from start to finish. They have learned that there is an individuality in the dairy cow, just as there is in men, in dogs, or in trotting horses; just as much difference in the individual ability of dairy cows as there is in the ability of men; and that is where many dairy farmers fail,—in studying the individual cow. We do business with the herd and pay attention to the cows collectively and not individually. It seems to me that it is every dairyman's duty to study each cow in his herd. Every herd in this state has some good cows and some poor ones, and in many of the herds the profit derived from good cows is lost in supporting the poor ones.

I get letters every day asking about the Babcock test, about how to test cows, and about a way of testing cream. I received a letter yesterday from a dairyman of this state asking me what size of a Babcock test he ought to have to test six cows, and if a Babcock test would test both milk and cream, and if he could force the butter maker at the creamery to give him just dues if he had a test of his own. Now, that man was all right in his way, and yet, reading between the lines, you could see he was dissatisfied with the returns from the creamery and he had a fond hope that through the Babcock test he might force the butter maker to recompense him for supposed losses. Now, he was looking at the wrong end of the business. He ought to study his cows, to test them carefully, to test his cream, test his milk also that gives the cream, so that he might be able to say to the butter maker, "My cows test so-and-so, my cream contains such a per cent of fat, I have a Babcock test of my own, I know just exactly what the cows are doing, what my milk and cream test and shall hold you responsible for the test of the cream."

A great many dairymen complain of the market end of their business, they cannot get enough for their cream, do not get the price for the butter that they think adequate to compensate them for their work and labor. Now, we as farmers have but little influence over the market end of the business in which we are engaged. We do not make the price of butter or cream, but we can make the cost price of cream and milk on the farm less by keeping down the cost of feeding the cows, by feeding them more intelligently, giving them better care. If we can cheapen the cost price of one hundred pounds of milk on the farm, we have added to the price we receive for it. That is the way to make more money: Cheapen the cost of production, and with the returns keep better cows, and to do it we must keep better cows. You must raise the individuality of the single cow in the herd—not study them collectively, but test each one, find out how much feed she can consume, and whether you are feeding her the right kind of feed.

Adjourned to 2 P. M.

AFTERNOON SESSION.

The convention met at 2 P. M.

President Hill in the chair.

The Chairman: In introducing to you the first speaker of the afternoon, I want to say that if there is any man in Wisconsin competent to know the ins and outs of dairying on Wisconsin farms, it is Mr. C. P. Goodrich of Fort Atkinson. I can remember the very first Wisconsin Dairymen's Association that I attended. It is longer ago than you think it is, from my looks. It was at Ripon, I think, in 1887, and I remember having Mr. Goodrich pointed out to me as being at that time the man who was from week to week shipping butter to the Chicago market and was getting higher prices than any other dairyman sending butter to that market. Mr. Goodrich continued that dairy farming for many, many years, until he became,—I won't say he became an old man, because he is only a young fellow yet,—until he obtained a well deserved rest and he is now living in Fort Atkinson. He is one whom every dairy farmer in Wisconsin will be glad to listen to, and I am sure you will be glad to listen to Mr. Goodrich. We familiarly call him "Uncle Perry;" we more familiarly call him "Uncle Humus." Possibly when he is through with his address this afternoon and you come to know him better, you will possibly see why we so affectionately call him "Uncle Perry," and even may know why we call him "Uncle Humus."

A WAUKESHA COUNTY COW CENSUS.

C. P. Goodrich, Ft Atkinson.

Once more I appear before the meeting of the Wisconsin Dairymen's Association with the results of a "Cow Census," or an investigation among creamery patrons, hoping that by studying the facts which I have gathered in my work some dairymen may be able to adopt better methods which will make the business more profitable.

FARMERS WANT HIGHER PRICES.

All farmers desire to sell their grain and forage at the highest possible price. They will put forth the greatest exertion to get a little more than the ordinary market gives them.

So great is the desire to do this that some have joined together and formed what they call the "American Society of Equity," through which they hope, by combination, to "control prices." They say all they ask for is "fair prices." But if it were possible to do this impossible thing, there is no telling to what extent the greed of the farmer might raise prices. This society publishes a paper in Indianapolis, Ind., called Up-to-Date Farming. Some of the writers in this paper denounce the agricultural colleges and teachers that are teaching the farmers how to raise bigger crops. They say that the bigger the crops are the farmer raises, the worse he is off, for increased supply depresses prices so that a big crop brings less money than a small one.

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THEY BURNED COTTON IN TEXAS.

This idea got such a hold in Texas that, awhile ago, when they had an immense cotton crop, it was advised that planters should destroy a part of their crop so that the balance left would bring more than the whole would if all put on the market.

Some planters actually did burn a portion of their crop with this idea in view.

If these schemes were actually worked out, it is easy to see that somebody would have to suffer. The consumer would have to pay for it. The hardship of high prices for the necessities of life would be his.

DAIRYMEN CAN MAKE COWS PAY HIGH PRICES.

But the dairyman can raise the prices of his grain and forage and not oppress anybody. He can make the cow pay more. That plan will surely cause no hardship for the consumer and no suffering for the cow, for the cows that produce the most and thus pay the most for their feed are the most happy and contented cows in the land.

INVESTIGATIONS IN WAUKESHA CO., WIS.

My investigations this winter with the dairymen were carried on in this—Waukesha—county among the patrons of the Heimerl Creamery Co., the creamery being located at Wales. I came to Wales last month and visited forty of the patrons of the creamery, which was all who had patronized the creamery continuously for the twelve months immediately preceding the 31st of October last.

I visited the farm of every one of these forty patrons, saw every one of the cows they had at the time, noted their apparent breeding and type—especially the type—looked over their barns and talked with the proprietor. From him I ascertained the average number of cows he had kept the previous year, found out from him as best I could the amount and kinds of feed the cows had had, and estimated the average cost of the feed for a year of the cows of the herd.

The patrons could, most of them, give a pretty fair idea of the amount of grain food their cows had had. Some of them could tell exactly for they had bought it and had kept the account. Some had had it ground and knew how much they had paid for it.

HOW AMOUNT OF COARSE FORAGE WAS ESTIMATED.

But the coarse forage, the farmers could not tell much about what amount their cows had eaten. They had had all they wanted, for it was plenty and not high. I had to estimate the amount of that from some facts I had learned by past experience. For instance, I had learned that a cow that had no other feed than dry forage would consume about 3 per cent of her own weight daily. Therefore, a 1,000 pound cow would eat about 30 pounds a day during the feeding season, or 200 days, making about 3 tons of fairly good hay, or its equivalent in some other forage.

If a cow was fed some grain food, of course, she ate less coarse forage. If she had ten pounds of grain food, she would not eat more than 20 pounds of coarse food, and so on. In this way I estimated the amount of food.

PRICES OF DIFFERENT FEEDS.

I charged the cows in each herd the same price for the same kind of feed, and that was just the market price on the farms. Timothy hay \$8 a ton; clover hay \$6; marsh hay \$5; corn stover \$2.50; silage from well eared corn \$2.50; ear corn \$12; shelled and ground \$16; oats ground \$21.50; bran \$18; middlings \$20. Pasture was abundant and excellent, for which I charged a uniform price of \$5 a head for the season.

I have arranged all these facts in tabular form, giving the patron's number; number of cows; kinds of cows; cost of feed per cow; returns for butter from creamery per cow; pounds of milk per cow; pounds of butter per cow; average price of butter; average price of milk per 100 pounds; value for butter for one dollar's worth of feed and net profit or loss from butter per cow over cost of feed.

This table will be published in full, but I will not take the time now to read the whole of it—that would be rather tedious—but will make some selections from it, which will serve to illustrate the most important points.

Facts learned by investigating the dairy herds of 40 patrons of the creamery at Wales, Waukesha county, for the year ending October 31, 1905.

Patron's number.	Number of cow.	KINDS OF COWS.	Cost of feed per cow.	Returns for butter from creamery per cow.	Pounds of milk per cow.	Pounds of butter per cow.	Average price of butter, cents.	Average price of milk per 100 lbs., cents.	Value of butter for one dollar's worth of feed.	Net profit or loss from butter per cow over cost of feed.
1	18	Shorthorns and Shorthorn grades; not very good dairy type	\$ 23.00	\$ 29.84	3540	154.2	19.4	83.3	1.29	6.84
2	9	Common stock; fairly good dairy type.	24.50	30.30	3470	157.2	19.3	87.3	1.24	5.80
3	9	Mixed breeding; not good dairy type.	27.50	28.40	3290	147.1	19.3	83.2	1.08	.90
4	23	Mixed breeding; some good dairy type others scrubs	27.25	32.72	3478	166.3	19.7	94.1	1.20	5.47
5	7	4 grade Jerseys; 3 grade Shorthorns; very good dairy type.	35.00	46.56	4752	220.2	21.1	96.0	1.33	11.56
6	25	Mixed breeding; scrubs and poorly cared for	23.00	22.92	2532	117	19.6	90.5	.88	-3.06
7	19	1 Jersey, some Ayrshires, some grade Shorthorns, some common; very good dairy type	28.50	42.37	4555	207.8	20.6	93.0	1.49	13.87

Facts learned by investigating the dairy herds of 40 patrons of the creamery at Wales, Waukesha county, for the year ending October 31, 1905—Continued.

Patron's number.	Number of cow.	KINDS OF COWS.	Cost of feed per cow.	Returns for butter from creamery per cow.	Pounds of milk per cow.	Pounds of butter per cow.	Average price of butter, cents.	Average price of milk per 100 lbs., cents.	Value of butter for one dollar's worth of feed.	Net profit or loss from butter per cow over cost of feed.
8	10	Grade Shorthorns; fairly good dairy type	25.00	33.47	cr'm	164.4	20.4	.....	1.31	8.47
9	10	1 grade Jersey, rest grade Shorthorn and common; good dairy type.....	29.00	60.01	6000	282.5	21.3	100.0	2.07	31.01
10	16	One-half grade Shorthorn, balance grade Jerseys; good dairy type.....	34.00	66.89	5638	314.6	21.2	112.6	1.97	32.89
11	19	Common stock; mixed breeding.....	26.00	31.23	3585	155.6	20.0	87.1	1.20	5.23
12	16	Common stock; mixed breeding 2 Jerseys; fairly good dairy type.....	29.50	32.76	3538	160.3	20.4	92.0	1.11	4.26
13	9	Some Jersey, some Shorthorn blood; fairly good dairy type.....	28.80	37.85	4124	186.7	20.3	90.1	1.39	9.05
14	8	Common stock; fine dairy type.....	29.50	59.30	6258	237.5	20.6	94.6	2.01	29.80
15	13	Common stock; a little Jersey blood; medium dairy type.....	33.00	38.23	4059	183	20.9	94.2	1.16	5.23
16	13	Grade Jersey in breeding, but scrubby looking.....	32.00	27.33	2908	130	21.0	94.0	.85	-4.67
17	21	Common stock; medium dairy type...	30.00	37.09	3981	176.5	19.8	87.9	1.17	5.09
18	9	Common stock; very good dairy type	29.50	53.07	5850	236.7	20.7	90.7	1.80	23.57
19	8	Common stock.....	31.50	50.36	5323	246.3	20.4	91.6	1.80	18.86
20	8	Mixed; would be fair dairy cows if properly fed.....	28.00	31.37	3868	167	18.8	81.1	1.12	3.37
21	17	Mixed; fairly good dairy type, but rather scrubby.....	25.00	35.93	3577	177	20.3	100.0	1.44	10.93
22	25	Grade Shorthorns; fairly good dairy type.....	26.00	39.40	cr'm	189.9	21.8	.....	1.51	13.40
23	12	1 G., 1 G.-H., 1 G.-J.; fine dairy type; balance Shorthorn; very good dairy type.....	25.00	53.71	cr'm	257.4	20.9	.....	2.15	28.71
24	15	Mostly grade Shorthorns; beefy type; 1 grade Jersey.....	31.50	37.73	4719	188.6	20.0	80.0	1.19	6.23
25	14	Some Shorthorn, some Jersey and common; good dairy type.....	37.00	54.50	5414	259	21.0	100.0	1.47	17.50
26	6	1 Grade Jersey, 1 Grade Holstein; balance grade Shorthorns; fair dairy type.....	31.00	40.70	4879	213.6	18.6	83.4	1.31	9.72
27	14	6 Grade Jerseys, fair dairy type; balance grade Shorthorns, very good...	30.80	38.82	4185	191	20.3	92.8	1.26	8.02
28	13	3 high grade Jerseys; balance, common stock.....	28.00	33.15	cr'm	163.4	20.3	.....	1.18	5.15
29	20	Grade Jersey; 1 full blood; good dairy type; 10 heifers with first calf.....	32.00	56.74	cr'm	281	20.2	.....	1.77	21.74
30	9	Mixed breeding; very good dairy type	32.50	50.65	cr'm	248.1	20.4	.....	1.56	18.15
31	15	3 Brown Swiss; rest mixed, fairly good dairy type.....	40.00	41.28	3971	193.5	21.3	101	1.03	1.28

Facts learned by investigating the dairy herds of 40 patrons of the creamery at Walee, Waukesha county, for the year ending October 31, 1905—Continued.

Patron's number. Number of cow.	KINDS OF COWS.	Cost of feed per cow.	Returns for butter from creamery per cow	Pounds of milk per cow.	Pounds of butter per cow.	Average price of butter, cents.	Average price of milk per 100 lbs., cents.	Value of butter for one dollar's worth of feed.	Net profit or loss from butter per cow over cost of feed.
32 13	10 Jerseys; 3 grade Jerseys; good dairy type.....	26.00	46.85	cr'm	229.1	20.4	....	1.80	20.85
33 19	Common stock; not very good dairy type.....	31.00	34.49	3966	174.6	19.8	87	1.11	3.49
34 9	Common stock; small but fairly good dairy type.....	24.00	41.18	4527	204.5	20.1	90.7	1.71	17.18
35 20	Mixed breeding, rather scrubby looking.....	39.00	40.11	4243	196.1	20.4	91.8	1.03	1.11
36 14	Grade Shorthorns; fairly good dairy type.....	38.00	50.69	cr'm	244.4	20.7	....	1.33	12.69
37 18	Grade Shorthorns, beefy type.....	31.00	33.63	3648	180.5	20.9	92.1	1.08	2.63
38 11	Common stock; good dairy type.....	37.00	54.59	5331	243.8	22.4	103	1.48	17.59
39 16	1 grad. Jersey; rest grade Shorthorns, dairy type.....	31.00	57.88	6050	279.7	20.6	95.7	1.77	24.88
40 5	2 Grade Jerseys; 1 Grade Holstein, good type; 3 scrubs.....	25.00	44.18	4611	221	20	95	1.77	19.18

COWS FED NO GRAIN.

In the vicinity of Wales last year coarse forage was cheap, concentrated food high and pastures good. Under such conditions some dairymen think that it is most profitable to feed no grain in winter; have cows fresh in spring and produce most of their milk on good pasture. This seems quite plausible. Let us see what the facts I have found indicate.

Number one had 18 cows: Short-horns and short-horn grades; not very good dairy type; fresh in spring. Feed was clover hay, a little marsh hay and a little corn stover worth \$18.00. No grain; pasture \$5.00; making total cost of feed per cow \$23.00.

Returns from creamery, \$29.84; net profit per cow \$6.84. Pounds of milk per cow, 3,540; pounds of butter 154.2; price of butter 19.4 cents; price of milk per 100 pounds 83.3 cents. One dollar's worth of feed brought \$1.29.

Number 2: had 9 cows; common stock; fairly good dairy type; fresh in spring. Feed was timothy hay and a little corn stover,

worth \$19.50; no grain; pasture worth \$5.00, making total cost of feed per cow for the year \$24.50. Returns from the creamery \$30.30, making a profit over cost of feed of \$5.80; pounds of milk per cow 3,470; pounds of butter 157.2; price of butter 19.3 cents; price of milk per 100 pounds 87.3 cents. One dollar's worth of feed brought \$1.24.

COWS FED GRAIN LIBERALLY.

Now we will compare these two patrons with two others who had about the same grade of stock but who fed high, notwithstanding the high price of grain, and had their cows mostly fresh in the fall.

Number 36 had 14 cows, grade Shorthorns, fairly good dairy type, fresh in early winter and spring. Feed was clover and timothy hay worth \$14.00; corn and oats ground and bran 10 pounds a day in winter worth \$19.00, and pasture \$5.00, making total cost of feed for the year, \$38.00. Returns from the creamery, \$50.69, making an actual profit of \$12.69. This patron had a hand separator and sent cream which produced 244.4 pounds of butter; price of butter, 20.7 cents. One dollar's worth of feed brought \$1.33.

Number 38, had 11 cows: common stock; good dairy type; fresh in fall. Feed was timothy hay and corn fodder worth \$12.00; ground oats and corn and bran, 12 pounds a day, worth \$20.00; pasture \$5.00, making a total cost of feed per cow per year \$37.00. Returns from creamery \$54.59, making an actual profit of \$17.59. Pounds of milk per cow 5,331; pounds of butter, 243.8; price of butter 22.4 cents; price of milk per 100 pounds \$1.03; one dollar's worth of feed brought \$1.48.

It will be seen that number 38 got 3 cents a pound more for his butter than did numbers 1 and 2 and one and a half cents more than did number 36. This is because he produced the most when the price was the highest.

I think this comparison between Nos. 1 and 2 and Nos. 36 and 38 fairly represents the situation. At any rate, you have the facts and you can take your choice.

SMALLEST AND LARGEST RETURNS PER COW.

I next will compare the patron who got the smallest returns per cow with the one who got the largest returns.

No. 6 had 25 cows, mixed breeding, and all rather scrubby looking; fresh in mid-winter and spring. Feed was marsh, timothy and clover hay and corn stover, worth \$15.00; an average of about 600 pounds of ground corn and oats per cow during the winter worth \$6.00; pasture \$5.00, making total cost of feeding \$26.00 per cow. The stable was fairly good, but rather filthy.

Returns from creamery per cow \$22.90; cost of feeding, \$26.00; making an actual loss of \$3.08 per cow. Pounds of milk per cow 2,532; pounds of butter 117; price of butter 19.6; price of milk per 100 pounds 90.5 cents; received for one dollar's worth of feed 90 cents.

No. 10 had 16 cows, $\frac{1}{2}$ Shorthorn grades; balance Jersey grades; all good dairy type. One-half were fresh in fall and $\frac{1}{2}$ in mid-winter. They were fed clover hay and shredded corn fodder \$11.00 worth per cow; bran and middlings in winter, 15 pounds per day to fresh cows; $\frac{1}{2}$ as much to others, making an average of \$18.00 worth per cow; pasture \$5.00. Total cost of feeding per cow \$34.00.

Returns from creamery \$66.89 per cow; profit over cost of feed \$32.89. Pounds of milk per cow 5,938; pounds of butter 314.6; price of butter 21.2 cents; price of milk per 100 pounds 112.6 cents. Received for one dollar's worth of feed \$1.97. This patron had a good, comfortable, tidy stable, although his cows were fastened with rigid stanchions, as were all others I have so far mentioned. He is a student of his business. He takes dairy papers and studies dairy literature. He sells the products of his farm and the feed he buys at double the price they sell for in the market. He gets more than twice as much for them as number 6 does. Number 6 might do as well, if he would learn to adopt the same methods.

The only criticism I have to make on number 10 is that possibly he feeds some of his cows a little too heavy on concentrated food for the future good of the cow, and possibly—though I am not perfectly sure of it—he might make a greater *per cent* of

profit on his feed—though not quite so big gross returns per cow—by feeding a little less of concentrated food.

POSSIBLY AN EXCEPTION.

Number 9 had 10 cows; 1 grade Jersey; balance grade Shorthorns and common stock; $\frac{1}{2}$ fresh in fall; rest in spring. Cows were fed clover and some timothy hay and corn stover worth \$14.00; bran, corn and cob and oats ground nine pounds each to fresh milkers, \$10.00; pasture \$5.00, making \$29.00 per cow.

Returns from creamery, \$60.04 per cow. Deducting \$29.00 for cost of feed leaves an actual profit of \$31.04. Pounds of milk per cow 6,000; pounds of butter 282.5; price of butter 21.3 cents; price of milk per 100 pounds 100 cents. One dollar's worth of feed brought \$2.07.

This patron says he does not read dairy literature, but he was a conundrum to me. When taking this census I wrote what I thought of the cows when I saw them, and occasionally in the blank of "remarks" I wrote my impressions of the man.

This is what I wrote at the time concerning this patron: "He does not *seem* to believe in progress in dairying; still he has remarkably good cows and must be doing well. I mistrust he talks that way and does not mean it." When I got his returns from the creamery, I felt quite sure I had sized him up about right.

Cows that paid the highest price for feed and those that paid the lowest price.

I will now contrast two patrons, one of which sold the feed his cows ate at a higher price than any other patron, and another who sold the lowest of any, and see if we can find out why one man should sell his oats, corn, hay and pasture for $2\frac{1}{2}$ times as much as another man and both selling to cows.

Number 23 had 12 cows; 9 grade Shorthorns; very good dairy type, 1 full blood Guernsey, 1 grade Holstein, 1 grade Jersey; these three, fine dairy type; $\frac{1}{2}$ fresh in the fall and $\frac{1}{2}$ in spring. They were fed clover and timothy hay and corn fodder worth \$7.00. Silage 35 pounds a day per cow, worth \$8.00. Three pounds of bran fed on silage worth \$5.00, and pasture \$5.00, making total cost of feed per year per cow \$25.00.

Returns from creamery \$53.71, deducting cost of feed leaves \$28.71, actual profit over cost of feed. Pounds of butter per cow 257.4; price of butter 20.9 cents. Has hand separator. One dollar's worth of feed brought \$2.15.

In my "remarks" I wrote of this patron: "He takes dairy papers and is a student of the business, and I predict that he will succeed better than most men."

Let us contrast number 16 with number 23. Number 16 had 13 cows, grade Jerseys in breeding but scrubs in looks. Fresh in fall. Feed: timothy, clover and marsh hay and corn stover, \$12.00; bran and middlings, 8 pounds a day after January 1st, \$15.00; pasture \$5.00, making total cost of feed \$32.00. Returns from creamery, \$27.33. Loss on feed, \$4.67; pounds of milk per cow 2,908; pounds of butter 130; price of butter 21 cents; price of milk per 100 pounds 94 cents. One dollar's worth in feed brought 85 cents in returns from creamery.

Truly, number 16 worked for small wages and sold the products of his farm very cheap. Much of his failure was caused by not feeding his cows well (which were fresh in the fall) until mid-winter when they were nearly dried up. Then he fed higher, but the flow of milk could not be brought back.

DON'T LOVE DAIRY COWS.

Number 24 had 15 cows; mixed breeding, mostly grade short-horns of beefy type. Fresh at all times of year. Feed: clover, and timothy hay at \$18.50; corn and oats ground and bran, \$8.00; pasture \$5.00; making total cost of feed \$31.50. Returns from creamery \$37.73, leaving for profit \$6.23. Pounds of milk per cow 4,719; pounds of butter 188.6; price of butter 20 cents; price per 100 pounds of milk 80 cents. One dollar's worth of feed brought \$1.19. He does not read dairy literature, and says he has not much love for the dairy cow, but likes the beef cow better. This no doubt accounts for his small profits.

TWO GOOD DAIRY HERDS.

Number 32 had 13 cows; 10 full blood Jerseys; 3 grade Jerseys; $\frac{1}{2}$ fresh in fall and $\frac{1}{2}$ in spring; all fine dairy type. They were fed timothy hay \$8.00 worth; silage 25 pounds a day,

\$6.50; bran 4 pounds a day \$6.50; pasture \$5.00, making total cost of feed \$26.00 per cow.

Returns from creamery, \$46.85, making a profit of \$20.85 per cow. Pounds of butter per cow, 229.1; price of butter 20.4; had hand separator. Barn good, well lighted and whitewashed. He reads dairy literature and when he gets to feeding more clover and less timothy hay and a little more of the right kind of grain food, he will do better. As it is, one dollar's worth of feed brought \$1.80. Such cows as his ought to bring more.

Number 29 had 20 cows; 10 of them heifers with first calf. Grade Jerseys; one full blood Jersey, good dairy type; fresh in winter and early spring. Feed: timothy and clover hay and a little corn fodder, \$7.00; silage 30 pounds, \$7.00; middlings and bran, 8 pounds, \$13.00; pasture, \$5.00; making cost of feed \$32.00.

Returns from creamery, \$56.74; profit over cost of feed, \$24.74. Pounds of butter 281; price of butter 20.2 cents. Has hand separator. One dollar's worth in feed brought \$1.77.

This is a remarkable showing, considering that half his herd were heifers. He studies dairy literature. His barn is well lighted, has King system of ventilation. Has patent revolving, adjustable stanchions for cows, with partitions between them. He also has a manure carrier in his stable, as have some others in the neighborhood.

SOME AVERAGES.

The whole number of cows kept by these 40 patrons was 556, an average of 14 cows to the herd. The average pounds of butter per cow was 202.1, and the average price was 20.4 cents a pound. The cost of keeping per cow was \$30.00 and the average returns for butter per cow was \$41.29, leaving an average net profit above cost of feed, \$11.29.

Number 10 had the highest yield of butter per cow, 314.6 pounds, with a net profit of \$32.89 per cow.

Number 6 had the lowest yield of butter per cow, 117 pounds, with a loss of \$3.08.

Number 38 received the highest average price per pound of butter, 22.4 cents, and an average net profit per cow of \$17.59.

No. 26 received the lowest average price per pound of butter, 18.6 cents with an average net profit per cow of \$9.72. Number 26 had his cows all fresh in spring, and fed very little grain in winter.

The creamery books show that they produced nearly all their butter in summer when prices were the lowest. Number 38 had his cows all fresh in the fall and he fed them a heavy grain ration during winter. They produced the most butter when prices were the highest.

DOES IT PAY TO READ ABOUT YOUR BUSINESS.

I made inquiry of every patron whether he took papers devoted to dairying or studied dairy literature. Twenty-five answered "No." Their net profits were \$8.95 per cow on an average. Eight patrons said they took agricultural papers that had some dairy reading in them. Their profits were \$10.94 per cow. Seven patrons took papers specially devoted to dairying and they studied dairy bulletins from the agricultural colleges and other dairy literature, and their profits averaged \$21.87 per cow. Those who read about their own business made \$12.92 more profit per cow than did those who confined their reading to other subjects. With the average herd of 14 cows, this dairy reading seems to mean \$180.88 added profits. Does it pay to read about one's own business?

Remarks made during reading of paper.

I found when I came to Wales, a community of prosperous farmers. In the main, they were really good farmers. I found that they had excellent barns, as a rule. I did not find a cold barn among all the barns that I visited. There were some, it is true, that were not well ventilated, and in some of them the atmosphere was not as pure as it should be for that reason, and some of them were somewhat filthy. I found some first class barns, that had all modern conveniences and equipments for keeping cows, that were well ventilated and well lighted and whitewashed. I will mention two of them. The barn of Row-

land Brothers is equipped very nicely and a man by the name of David James has a barn that is fixed in fine style, and I would suggest to any one that is going to build a new barn or remodel an old one, it might pay you to visit these barns. They are in different styles altogether, and one may suit your ideas and your circumstances, or the other one might suit you better.

Now, it was absolutely necessary that I should have the co-operation of the people where I was going to do the work. I had to have that and I want to say that I did have it. In almost every instance the patrons of the creamery were willing and anxious to give me all the information that I wanted. And it was also necessary that I should have somebody that was acquainted with the people and somebody that the people had confidence in to go with me, to introduce me, otherwise some people would be suspicious and think I was working some scheme for myself. Mr. O. M. Rowlands went with me about one-half the time, and Mr. Morgan Jones, the other half, and I have to say that the people seemed to have great confidence in those men and were very free to talk with me. I also had the co-operation of Mr. Heimerl, manager of the creamery. The creamery is run in good shape, there is no question about that, and the patrons are receiving as big pay as they are from any creamery that I know of. I felt that I ought to say these things.

I want to talk a little about number 6. He had twenty-five cows. I went out to his stable, he said he had good cows. I hope Number 6 is here, because I want to tell him some truths, and I know he is a man that wants to make money just as much as you or I do, and I guess he is doing pretty well in other lines of farming, appears to be. I went out to the stable and he had fifteen cows in the stable. The stable was not the neatest that ever was; it was warm enough; it was not very well ventilated, did not smell first rate, the air was a little close, cobwebs hung down two or three feet, showing that he had not even made any attempt to clean it up, and the cows did not look as though they were giving very much milk. I asked him if the cows were doing

well, and he said, yes, they were doing well. Now, he thought so himself, that they were doing well. He said, "Why, I get two cans of milk a day." I looked around and I saw the cans and they were the ordinary eight gallon cans, and he got two cans a day. I said, "Do you carry your milk every day?" "No," he said, "every other day to the creamery," so that he brought up every other day those four cans full of milk and that is what he was taking from a herd of twenty-five cows, fifteen of them only were giving milk. Well, I wanted to see the others, I said, "These are not all your cows?" He said, "There are some that are dry." I said, "Let me see them." I went out and looked them over and they were the same kind of cows, that is, mixed. And I wanted to find out the breeding, I said, "Have you got some Jersey in it?" I could see once in a while one with a mealy nose, that is one of the signs, you know, when all the rest of the characteristics are blotted out, that will stick out. He said, "Yes, I had a Jersey bull once." I looked around a little more, and I said, "I see some of them look as though they had some Ayreshire blood in them." "Yes, I had an Ayreshire bull once." Then I looked a little further and I said, "There is one that looks as though it had some Galloway blood in it," and he said, "Yes, I had a Galloway once." And I saw the animal at the head of his herd now, and the Lord only knows what that was. Now, that was the situation there with the man that was losing money, not getting paid for his feed, and I hope that he is here, because he will know that I mean him, for he will remember that conversation, and I said, "Are they good cows?" and he said, "There is one of the best, the most splendid cow I have got, and she is a fine cow." She had the Galloway blood more than anything else and she had plenty of hair.

It is a fact that there are hundreds of cows in Wisconsin and in the United States today that are ruined by two heavy feeding of concentrated foods. I am an advocate of very generous feeding and feeding up to the full capacity of the cow; that is, all she can eat and digest and turn into milk, but it must not be too much of the concentrated food. Look over the records of these great cows, and see what wonders they do. Do they ever re-

peat it? Never. They had been fed too high on concentrated food. There were seventy-five cows down at Chicago at the World's Fair, twenty-five Jerseys that made a remarkable record, that were crowded to their utmost, they had from 20 to 25 pounds of concentrated food, and do you know of one of them that ever did anything afterwards? Not one of them, as far as I can find, except Mary Maiden, and it took three years for her to get back to producing much. Now, although I am advocating always high feeding, I want to give you this caution, that they must have a certain amount of coarse food or they cannot continue on year after year doing good business. A cow is made with a stomach and machinery for handling coarse food and that is her natural food and she has got to have it, she must have it or she will suffer in health. She needs some grain food because she cannot get enough milk out of the coarse food to do her very best. Now, the question is, what proportion of the feed should one-third of her ration concentrated feed, that is, if she can be concentrated feed? My rule is that a cow should have about make good use of it, and two-thirds coarse feed, and then you are perfectly safe, if you feed her properly and handle her right, until she is 16, 17 to 18 years old. Now, if she eats ten pounds of concentrated feed a day and twenty pounds of coarse feed, that is all right. If you feed her fifteen pounds of concentrated feed a day, as this patron did, you are running pretty close to the danger line, although his case was not so bad, because a great deal of it was bran and that is not so concentrated. But a man is ambitious; I know, I have been there myself. I spoiled some cows by feeding too high because I wanted to make a bigger record, but I got so that I watched to see that they would eat a lot of the coarse feed. I had cows that I fed 15 pounds a day, but I watched close to see that they ate a great deal of hay to go with it.

The largest cow I ever saw was Rosa Bonheur, at the Michigan Agricultural college; she weighed 2060 pounds when I saw her, and gave 104 pounds of milk a day for two months at a time. Prof. Smith wanted to see what a cow could do if she had just what she wanted to eat, so he put her in a box stall, with

some oil meal and cotton seed meal and ground oats and corn and all kinds of feed, and he said, "Rosa, there is your feed, take what you want, there is your own ration, see what you can do. She ate at will and produced 104 pounds of milk, but it ruined her. She ate, a good many days, 47 pounds of concentrated feed. Well, remember, she was two cows in one, in size. When you take that into account you will see it was about 23 or 24 pounds for an ordinary sized cow, but it ruined the cow, and that is the point I wanted to make. Next time I saw her she was not good for anything. I want to tell you the experiment has been tried with calves, to see how a calf would do without having any coarse food. When it is a week old, why the calf does not need any, but pretty soon, if it has a chance, it will begin to eat something and begin to extend its stomach, it is made for coarse feed, but experiments have been tried and a calf could not live two months on milk alone without any coarse fodder. They have to have it. A cow could not live on oatmeal alone, although I have heard some men say she would. She may one winter, but she would not be any good the next year.

DISCUSSION.

Secy. Burchard: I think perhaps it would be well to state whether in giving the average price received for butter, this was inclusive or exclusive of the creamery charge for manufacture?

Mr. Goodrich: This was exclusive of the charge; this is what the patron got. I took the number of pounds of butter, as it was kept in the creamery book each month and footed it up for the year, and divided the money by the number of pounds, that would tell how much he got. I don't know what the charge was for making, I did not inquire; they were all charged alike, they had all taken their milk to the same place and marketed it, so they all stood an equal chance; they all sold their grain and feed to cows, and some of them got a big price for it, and some of them got a small price for it.

Mr. Hodgson: I would like to ask Mr. Goodrich if this census would be equal to the shippers to Milwaukee, or to any large

city; if he thinks the creamery business would pay better than shipping. I observe you have not touched on shippers of milk and cream to the large cities?

Mr. Goodrich: No, I wanted to take those that all went to the same market. Now, I don't know which it the best; Mr. Hodgson no doubt could tell better than I could. I presume he has a better field, I don't know, but I wanted to compare those. It is the cow we are after—to try to improve the cow, and we wanted to take those that took their product all to the same market.

Now, do you know that if I should go to the patrons, if I had tried to find out how much milk they had sent and how much butter they got, I would not have found out one-quarter of the information. One man, where I stopped to eat dinner, said, "I can you tell just what my returns are from the creamery and the amount of milk." So he got his statements out and went to figure them up, and he found there was one month out, and he could not find it. Now, he did better than some of them do; some of them can do it, but it is best to go to the creameries, that is the easiest and best way. To take it among those who sell to Milwaukee, there would be great difficulty. I could not go to the man that he sold the milk to, unless he sold all to him, and I would not know, and then there are other things in the way that you can imagine yourself.

Mr. Clinton: I notice Mr. Goodrich has said nothing about the after-effects on the fertility of the soil?

Mr. Goodrich: No.

Mr. Clinton: I will ask you, in case of a farmer like No. 1, and in case of a farmer No. 10, in running their farms for ten years, one feeding concentrated feed like No. 10, and the other feeding like No. 1, what would be the comparative fertility of their soil?

Mr. Goodrich: Well, it would be better where they feed bran, oil meal, cotton seed meal, such as that. There is no question but what it would make the manure more valuable. Of course I have been working out things that I could figure right down fine, but I could not figure that out to tell exactly what the difference would be. There would be some difference.

Mr. Rowlands: You mentioned where they were feeding

silage. How much silage, what number of pounds, would be the ordinary feed for a cow per day?

Mr. Goodrich: I used to think about thirty pounds per day. One man that I interviewed, fed, he was quite sure, 35 pounds a day; another man fed 25, another fed 30; there were five or six of those fellows that fed silage. We think for ordinary cows, say small dairy cows like Jerseys or Guernseys, 30 pounds of silage is enough; if you have big cows like Holsteins, they need more.

Mr. Burley: Is there any question about how much corn there would be in the silage.

Mr. Goodrich: Certainly; if there is much corn in the mixture you want to feed fewer pounds.

Mr. Taylor: Do you think it is advisable for the average dairyman, feeding silage, to be very careful about the corn in the silage?

Mr. Goodrich: I think it is a good plan to have it well mixed in the silo, so that what you get out each day will contain about the same proportion. The way they used to run it into the silo, the ears would run to one side, and when taking from that side they would get too much of the corn.

Mr. Taylor: You did not understand the question. In making up a daily ration for a cow, would you make a careful estimate of the amount of corn that should go into the silage?

Mr. Goodrich: Yes, with ordinary good corn, the corn is about ten per cent of the weight. That is, with thirty pounds the cow would not get over three or four pounds of corn. You can figure that out.

Mr. Taylor: Let us have an understanding about it. He says from three to four pounds of corn in a day's ration of ensilage. My judgment is, from the kind of corn we raise, there is from four to five and one-half pounds in thirty pounds of ensilage, and in our system of feeding we make no account of that amount of corn the cow gets a day in her silage. We feed her just as much concentrated food as though she did not get that four or five pounds of corn in the silage.

Mr. Reese: I would like to ask Mr. Taylor if he ever saw the time when he got too much corn in the silage?

Mr. Taylor: No, I often have wished that I could raise corn

without any leaves. When a cow is fed silage, she can handle a larger amount of feed in a day, and safely handle it. If she were fed on dry feed I would not think for a moment of feeding her four or five or more pounds of corn, but I can feed her on silage and have her do good work for me. It is safer to feed a heifer with silage corn, and it is also safer to feed corn when cows are out in the pasture,—I mean corn meal in the summer time. If you want to add anything to your pasture, give her corn meal.

Mr. Goodrich: That is right; corn is the best thing to feed on the pasture, I am satisfied of that. Cows know something, and cows refuse to eat bran when they are given grass to eat, very often, but I never had one refuse to eat corn meal. The cow gets protein enough out of the pasture grass and she is willing to take more carbohydrates out of the corn.

Mr. Hodgson: Supposing the corn stalk loses ten per cent in value in the silo,—I think that is the calculation,—through the heating process, how much difference in the loss in the corn and the stalk in the silo by the silo process?

Mr. Goodrich: I don't know that I understand you, you say the corn loses 10 per cent?

Mr. Hodgson: I think that is the calculation, I think that is the average.

Secy. Burchard: He says it loses 10 per cent in value.

Mr. Goodrich: Oh, no, I would not agree with that. My position is that corn when made into silage loses some in weight, loses some in dry matter, but it loses nothing in feeding value; it is worth more for feed after it has been in a silo than it was before, and I tell you my authority, an authority higher than any literature or any professor in any agricultural college, and that is the old cow.

A Member: I would like to ask you if you have ever fed a cow exclusively on silage?

Mr. Goodrich: Exclusively? No, I never did.

A Member: How do you obtain your results, if you answer by the authority of the cow?

Mr. Goodrich: I will tell you. I have taken corn just cut from the field and given a change of feed to a cow and she would drop off in milk and in butter when she would get the fresh corn,

and increase when she would get her feed out of the silage when it was put before her. And I have seen put before a whole herd of cows silage four years old, and fresh good corn fodder that was just right to put into the silo, when put before each of a herd of twenty cows, every one took the corn silage and said, "That is the food for me, give me some more."

Mr. Linse: Mr. Taylor has just referred to the fact that we do not pay enough attention to the amount of corn in the silage. I am just in the same position, but I do notice one thing,—my corn is heavy eared, in some cases it is heavier than in others, but whenever I get on the heavier eared corn, the heavier the ears, the more the flow of milk will increase. When I get on the heavier corn I feed the other concentrated feed just the same, that is, bran and other feeds, but I do notice a little change when I got on the heavier ears. That is my experience.

Secy. Burchard: Mr. Linse, when you feed the silage with more corn in it, the heavier eared corn, do you weigh it out, the same amount, pound for pound?

Mr. Linse: No, I do not, I measure it.

Secy. Burchard: It is a great deal like men feeding bran to cows, or feeding oats or ground corn, they feed by the measure and not by the weight, and then get up in a convention like this, or more frequently on the street corner or in some grocery, or something of that kind, and say, "Oh, I would just as soon have shavings for my cow as bran." But if they will feed the same number of pounds, irrespective of the measure, then they will find that bran has a feeding value far beyond their conception. And so with Mr. Linse. In my judgment, his silage with the greater amount of ears in it is measured in and he is feeding his cows more nutriment than when the ears are light, and that, rather than the greater proportion of corn in the silage, accounts in my judgment for the increase in the flow of milk. I want to say further, that experiments seem to have demonstrated that a pound of silage made from good, mature stalks, stalks that have thoroughly well matured, with the ears stripped off, is practically as valuable a feed for cows as silage made from the stalk and the ear together, pound for pound, but not measure for measure. Very few of us have any adequate conception of the value of corn, of the ears and of the stalks and the leaves of corn as a

milk producing, or even a fat producing food, because we have not used it properly. We have cut it up and we have shocked it in the field, and the winds and the rains have beat upon it until it is dried up to almost nothing, and then we throw it out on the snow, perhaps in the cold, for the cows to eat, and we will say, "Oh, well, corn stover does not amount to much as a food." Prof. Haecker has demonstrated that one of the most valuable foods for milch cows is what he calls corn fodder. He plows the ground late in the spring, harrows it and reharrows it until he gets a fine tilth and the soil is warm. Then he plants his corn, he harrows it before it is up; perhaps plants it with an ordinary seed drill with one or two spouts open. He lets that grow, not to produce ears very much, but to produce foliage. He puts that in the silo and he finds that about good silage as he can feed.

Mr. Linse: How does that compare in weight per acre of feed where the ears are produced; does he get as much, or more tons per acre?

Seey. Burchard: I cannot answer that.

Mr. Reese: That would be a direct contradiction to what Mr. Taylor says, would it? That is what I want to get at.

Mr. Taylor: No, no. I want to explain a little further what he said. He said without the ear was worth almost as much as the stalk with the ear. Well, there is about 40 per cent of the value of the corn plant in the stalk and about 60 per cent of it in the ear. Now, well preserved stalk mixed with a well-ripened ear, you get it in about the proportion of 40 to 60 per cent; there is not so very much difference chemically. I would rather have it in the pure ear than to have the matter that makes the ear scattered all along through the leaf and the stalk; it digests better in the animal stomach than if it goes on its way to the ear in the stalk.

Before I sit down I want to speak of another point. Mr. Goodrich looked over into this corner when he was talking about imperfect feeding. Now, he cautioned you about over-feeding. You are here in a dairymen's convention, and you hear us talking about feeding the dairy cow and feeding her plentifully and feeding her well. You go home to your herds and take an invoice, take a sort of census of what you are doing when you get back, and tomorrow or next week you will go down and get

a load of corn ground, a load of oats ground, and some cotton seed meal, and you get to feeding your cows better. Now, take what he has said about heavy feeding, overfeeding your cows, and be careful that you do not overfeed these cows that have been six or seven months in milk, that have run in your corn field and around the straw pile, be careful not to overfeed those cows that have been five or six or seven months in milk. But let me tell you, begin to feed a cow a little while before she freshens, and the more she eats the more milk she can give. It is as much easier work for a well-trained cow to give milk, as it is easier work for a trained horse to go fast on a track, it does not wear them out. But there is such a thing as overfeeding a cow when she is not in the proper physical condition, when she cannot receive and handle that feed. But begin with her soon after she freshens, and be very careful, as Mr. Goodrich says, that she does not get any check in her flow of milk. How surprised the boys will be, and how surprised the women will be, to see the flow of milk that old Brindle will give when she is handled right at freshening. There is another standard, that is, taking the cows, as our Jersey friends do, and Guernsey friends; a little while before they freshen, feed them high and keep right on feeding them high, even the day that they calve, and then a little while afterwards, making a good big flow of milk that astonishes everybody, and dairymen and breeders will be looking for that kind of blood to infuse some of it into their herds; that is another proposition. We are here to treat you as dairymen, we would like to make you better dairymen, more intelligent dairymen. Remember the cow that you have in your herd is not to blame for one single thing, and all you have a right to ask of her is that she is a well-born dairy cow, of dairy tendencies, and you are to blame for 169 things that she does not do the best in, and we will mention about 150 of them before we get through this convention.

Seey. Burchard: I would like to say to the gentleman here who suggested that there might be some difference between my opinion and that expressed by Mr. Taylor in regard to the silage, I do not object to the ears in the silage, mind you, I would not strip off the ears in the silage by any means. What I was getting at was, that pound for pound, the silage without ears has

been demonstrated to be nearly or quite as valuable as silage with the ears, but I do not know of any better way to dispose of the ears of corn, if you are keeping a dairy, than to put them into the silo with the stalks.

Mr. Taylor: Do you know of any way of raising a stalk that does not raise an ear?

Seey. Burchard: Yes.

Mr. Taylor: I think a stalk of corn that does not raise an ear is a sucker, and a sucker in a corn field is just as bad as a sucker in the human family.

Mr. Reese: I would like to ask Mr. Taylor which he would rather have, a ton of corn or a ton of stalk, for the purpose of feeding cows?

Mr. Taylor: We know we would not feed stalks alone; neither would we feed ears alone.

Mr. Reese: Which would be the more valuable?

Mr. Taylor: A ton of corn would be more valuable.

Mr. Reese: How many tons of corn can you raise on an acre?

Mr. Taylor: Two or three.

Mr. Reese: How many tons of stalks?

Mr. Goodrich: About a ton.

Mr. Taylor: We are getting corn and stalks, the best you can grow in this land for the dairy cow.

Mr. Reese: You have to plant your corn in hills to get this amount of corn.

Mr. Taylor: No, plant it in rows.

Mr. Reese: You get three tons of corn and one ton of stalks in that way?

Mr. Taylor: Well, dry stalks, maybe a little more.

Mr. Reese: I think you will find it just the other way, you will have one ton of corn and three tons of stalks, as a rule. If you want to raise corn, plant it the other way.

Mr. Emery: We will all of us take off our hat to the man who reared Brown Bessie, when he talks to us on the subject of dairying, but this afternoon he has spoken on this subject of corn fodder, and he speaks to us of a stalk that produces no ear as a sucker, and he does not believe that a sucker of corn is better than a sucker of the human family. Now, he speaks as a matter of belief, but that is not knowledge, that is not science, that

is not conclusive. He may believe a thing that is wholly in error. Now, it appears that in Minnesota Prof. Haecker has been conducting a series of careful experiments on this matter of raising corn fodder without the ears, claiming that they can raise a larger amount of corn fodder to the acre and produce a larger feeding value on that acre by that means of producing it, and it seems to me here is a question that is worth our careful consideration, and not side-track it as something that is already settled. Now, they are very sure there about the experiments of Prof. Haecker—he has been a very careful feeder, a careful experimenter—that it is a more profitable way of feeding, so I do not like to see that question sidetracked. I think it is a question for us to consider in Wisconsin, whether we can produce more fodder to the acre by planting this thicker corn with a different method of procedure and different culture.

Mr. Reese: The question comes up that any one who has a reasonably large silo has to put almost his entire farm into corn to fill that and has not got an ear of corn for the horse or hog, he has not got land enough to raise it. Now, if we could raise corn and raise more to the acre, that would fill that same purpose and give us ears for fattening hogs as a side issue, that is what I was trying to get at; if one offset the other. If it is just as good as this gentleman claims it is, it seems to me it will be the thing for us farmers to do; if it is not as good, on the other hand, we had better practice it as a side issue and raise the corn. But I do not know, I have not had much experience in feeding silage; but I think if you put corn into the silo that will give 100 bushels to the acre, I cannot see any direct results of putting all of that corn through the cattle; I cannot see that I get any more for it; in other words, they do not digest all of that corn, and if they do not digest it they get no benefit from it.

Mr. Philips: We have a farmer in our county that is farming 50 acres of land, he keeps 47 head of stock, he fills two silos, one for summer and one for winter. By continued dairying, such as this association recommends, he has got his land so rich that he fills those two silos from about 16 to 17 acres, fills them full and then he has two large cribs of corn left, and he sold the other day \$192 worth of pork. He is not a man that does not have an ear of corn left for a hog or a horse. He is farming intelli-

gently and he knows the value of corn and corn silage, and he demonstrates it.

Mr. Reese: According to their idea, if he raised it the other way, he might raise enough stuff to fill those silos on ten acres.

Mr. Philips: Well, he can.

Mr. Linse: It seems that the question is that a stalk of corn with a heavy ear is not worth as much to put into a silo as a barren stalk.

Secy. Burchard: No, that is not the question.

Mr. Linse: Suppose he takes two or three stalks with the ears taken off, it makes the same weight, but my experiences are that with the corn on it makes the silage more valuable than with the ear off. Now, I have got that far to find that corn stover put in a silo is more digestible, I will admit, and is a better feed material than a dry stalk, but it is not concentrated food like the corn in the silo. Take that out, it forms a part of our concentrated food, and of course they get so much more concentrated food if we feed heavier eared silage. Now, as Mr. Burchard said about feeding heavy eared silage, they get more of it, they get more weight, certainly, but my cows get enough of the coarse feed anyhow. If it is not in the shape of silage it is in the shape of clover hay, or something else, that is all made up, but I say, whenever they get the heavy ears in my silage, they increase in the flow of milk. Of course, it is more concentrated feed. But that shows that the stalk itself is nothing but the ground stalk and it may be more digestible, better than the dry corn stalk I will admit, but it is a corn stalk, nothing else, that is our coarse feed, and I do not believe in the theory that by putting that corn stalk in the silo, while it makes it more digestible, surely it does not make it so much over and above in value.

Ex-Gov. Hoard: But it is the age, the age of the corn stalk that makes it more digestible. The more it goes towards maturity, the less value it is.

Mr. Linse: About twenty-six years ago, when I put in my first silage, I put in the green stuff.

Ex-Gov. Hoard: Let me qualify a little. After the corn stalk with the ear of corn reaches the glazing stage, then the longer it stands the less feeding value the stalk has.

Mr. Linse: I have a couple of silos to fill and I start in every

time in the glazing stage, and before I get through it is pretty well matured.

Ex-Gov. Hoard: Very well. Now, which is the best silage, that that comes out in the top of the silo, the last on, or that that is down in the center or towards the bottom?

Mr. Linse: I have two silos. That which goes on at the top that would be the most matured.

Ex-Gov. Hoard: Is that the best silage?

Mr. Linse: Well, now, I must say that depends mostly on the well-eared corn which gives me the best results.

Ex-Gov. Hoard: Have you made any close experiments?

Mr. Linse: Well, maybe not, not as close as our experiment stations are able to make; I can only look at the buckets and returns from the cows.

Ex-Gov. Hoard: I think we are not dividing this question rightly, but mixing it, consequently we get a little confused. If we would take the late growth in a corn stalk we would see, maybe. Now, then, they buy the pith of the corn stalk to stuff war ships with, and it is called cellulose. Now, that is found in corn stalks after a certain age. A corn stalk itself is digestible when cut and put in a silo and the cows eat it, it is digested, and that pithy material, which we call cellulose after the glazing period of the ears, is sucrose or sugary matter before, but changes over as the ear advances, the stalk grows more and more worthless, so that if we keep our corn until the ears are good, we have taken right back out of our stalk its true feeding value, and if we put the stalk and the ear in the silo at the glazing period, we then reach the sum of the combined feeding value of both of them, and get a larger return of feed from the silo than we would if we undertook to feed the ear separate and then have the poor stalk separate. Therefore, we have not been dividing the question rightly.

Now, Prof. Haecker's experiments were to the effect that the stalk itself, taken at the glazing stage, was 40 per cent of the combined value of both stalk and ear, but carried on a week or ten days, the stalk was not worth 20 per cent. Now, if we lose twenty per cent, where did it go? The ripening of an ear is a mother proposition; the stalk is the mother, here is the offspring, the stalk gives the offspring of itself, and the qualities of the

ear are taken out of the stalk and go into the ear. Now, if we can put the stalk and the ear together and put the highest feed value into the stalk, it seems to me that we then can reach a question of economy. Now, it is not a question of whether the ears are worth the most, or the stalk is worth the most, that is not it at all; it is whether the stalk and the ear both cannot be made worth the most put into a silo together. Go into the town of Lake Mills, and there are five farmers, I think, in that town that have not a silo. Go over into Waukesha county, and it would be a pretty good township where five farmers out of a hundred had a silo. What is the reason that, at just a little distance apart, one set of men demonstrate the usefulness of the silo, and another set of men right up close beside them do not know anything about it, that is, I mean, as a whole; it is worth thinking about.

SOME OF MY FINDS AND EXPERIENCES.

H. C. Searles.

The old saying is, "What is worth doing is worth doing well;" and I think this can well be applied to caring for milk on the farm, and while being delivered to the factory as well.

Since I have been employed by the Dairymen's Association I have visited 175 cheese factories and creameries. And while I find a few in first class shape I find a larger number that are not up to date. The quality of milk delivered at some factories I have visited was very poor, or a large percentage of it; and the factory at which it was being delivered was in equally as poor shape as to sanitary conditions to receive it! In such cases I have made it a point to visit them the second time to see if my instructions had the desired effect on those interested, and was much pleased with the improvement the patrons had made as to cleanliness of milk and condition of cans, and might add the factory had been scrubbed out as well.

The two most essential things to good milk are cleanliness and quick cooling. The milking process should be carried on in such

a manner as to avoid contaminating the milk with dust and dirt. The udder and flanks of cows should be cleaned with brush or cloth to remove loose hairs and dust. The hands of milkers should be clean and his clothing as well. The feeding of dry fodder should never be done just before milking time, as there is a large amount of dust raised at such times. All utensils in which milk is handled should be so made that they can be easily cleaned. Some tinware is oftentimes apparently clean but not really so, for the seams give place for the lodgment of dirt. All seams should be well flushed with solder so that no crevices are left, to avoid difficulties that might arise from this source.

Rusty cans and pails should never be used for handling milk. Strainers of cloth should first be rinsed with cold water, then washed well and boiled. This should be done every day. Milk should be strained as soon as drawn from the cow, and not allowed to stand in the stable, nor any other place where there are bad odors.

It's a popular impression that warm milk will not absorb odors, but that is a mistake, for it does and more quickly than cold milk.

Patrons should take extra pains to cover milk cans with a clean blanket while being carried from farm to factory to keep off dust, and the hot rays of sun in summer, also in winter to keep milk from freezing. It seems to me there is little thought given to this important subject by most of patrons. I have seen so many coming to factory without covering on their cans and usually the cans are covered with dust and a good many when removing can cover would turn it up edgewise and let all the dust go into the milk, and when asked why they do that will say, "I didn't think." And another of the "did not think" kind are those that haul their milk on the manure wagon.

One thing that is overlooked in many of our cheese factories and creameries is the Wisconsin curd test. This should be used in all factories and will be a great benefit as each patron can see the difference between good and poor milk, therefore it would have a tendency to encourage each one to deliver the best milk possible. Clean, wholesome milk is not the only thing to be considered in a factory, for it is just as essential to have the factory clean as to have the milk clean.

In travelling through the country I find that there are some cheese makers that think all they have to do is to make cheese, the whey can be run out in any old dirty tank and carried home by the farmers, and if any bad conditions come back to him as a result that is none of his business. That's the farmer's business. Such men should never be allowed to make cheese or butter. On the other hand if a cheesemaker keeps a good clean factory and cleans the whey tank every day in this way he not only sets a good example for the patrons, but can in the most cases demand and get a good quality of milk.

DISCUSSION.

Ex-Gov. Harkis: I would like to ask Mr. Searles how many creameries he visited?

Mr. Searles: One hundred and seventy-five.

Ex-Gov. Harkis: How many stables did you visit?

Mr. Searles: Well, I did not visit the farmers very much.

Ex-Gov. Harkis: With how much interest do you find among these farmers and these factories and creameries in the idea of a clean stable, the right form of a clean stable and ventilation in their stables?

Mr. Searles: Very few that I find were interested very much in that line.

Ex-Gov. Harkis: It is impossible for any man to make clean milk in the ordinary Wisconsin stable. Is that so? In the ordinary average farm stable it is impossible to make clean milk, the cows get out on the ground, their udders and flanks, the milk spilled on the ground, and when they are milked and I do not think they are, they are often very dirty with all of what "dirt" means. I have seen it with the milk of such men; they will say, "My cows are clean," "Well, are they?" "Why, I clean 'em like anything." And I say, "Are your udders clean?" "Well, yes, as clean as I can get 'em." "Clean?" mentioning all that, and the fact that a cow has had just as dirty cows as the next one, and they are clean. A man came into my stable and when my horse and I at the door and stood

a moment, and said: "How often do you wash these cows?" I said, "They never were washed." "How often do you brush them?" "They are not brushed." "But," he said, "they are clean." "I know it." "Why, I do not see any manure stains on the white flanks of any of these cows, how do they keep so?" "Well," I said, "it is the form and fashion of the stable; the cows are obliged to be clean, and then we try to keep them clean, and then the stable is ventilated." And he said, "I noticed I could not smell any odor of stable in here."

Now, I will tell a story, if you can give me a minute. There are about half a dozen milkmen in the city of Fort Atkinson. The doctors have been sending me babies—doctors are responsible for babies, they say, more or less—they have been sending me babies. They were sickly and they were going into a decline and dying; the mothers could not nurse them, and the milk that they got, the babies refused, and the babies were going into a decline. I had eight of those babies on hand at once, and they are coming up and thriving and doing nicely. It is not because it is Guernsey, it is not because it is anything else than that the milk is clean, and a little baby with all of its instinct, powerfully sharp insight, refuses the food that is unfit for it, and takes to the food and thrives on it that is fit for it. There is an object lesson as to the value of a clean cow and a clean stable in that little record those eight babies are making that are on my hands and in my heart.

Mr. Emery: This subject of clean milk for the creameries and cheese factories and the village and city milk supplies of this state, in my judgment is the paramount issue today. And how to get this matter before the men who are producing this milk is an important topic. It is one I have given a great deal of consideration to and have had some practical experience in relation to it during the past year. I want to mention just one of the number of things we have been doing, and that we shall resume in the spring with a great deal of vigor, that we are now carrying on in the villages and cities of the state. For instance, in Milwaukee, and up in Green Bay, the entire forces are at work taking samples of milk. In Milwaukee they have 200 samples of yesterday and about 250 today, making about 450 in all, and these they are taking for the butter fat, testing them

for that, to ascertain the fact whether they have been watered or skimmed. These are very important matters. Well, will you think of it a moment, the comparative harmfulness of some clean water in the milk, compared with cow dung! Now, there is another test that we are making. We have four men, two sets of men, going into the dairies of the villages and cities of the state that are taking these samples of the milk; they have been doing this in factories so far as they could, they are now testing for the butter fat content for watering or skimming, and then they are applying the Wisconsin curd test to determine whether that milk has been produced under clean and sanitary conditions. Now, the Wisconsin curd test reveals this fact, and while we may not bring these patrons in the cities and villages to see these grades, we are trying to do it and we will resume our work in the creameries and cheese factories in the spring and shall pursue them with a great deal of vigor and energy. Take these samples of milks and apply this curd test. Now, where the milk is clean, the kind of milk that Gov. Hoard is producing, it produces a curd in about six to eight hours; it is clean and velvety; we cut it open and smell it and it has an attractive odor, agreeable, you feel as if you want to eat some of it, there is no mistaking it. We follow this up in scores of barns and up to the present time we have made no mistakes in our judgment as to the condition in which the milk was produced. Then there is another kind of curd that is produced that has gas holes, pin-holes, the gas holes look like the little holes in dough which is kneaded, and produced by the same reasons, it is the gas expanding that produces these little round openings. Now, that gas is produced by the gas forming bacteria that thrive in filth, and where the milk is produced under those filthy conditions, and where it is not properly cooled and cared for; or if it is it is kept too long. Sometimes it happens that it is kept over until the milk gets into this condition, then we get these curds. Now, if we cannot produce the best quality of butter or cheese from such milk, is it suitable for children and invalids?

What we are going to do and continue to do is to bring these patrons, so far as we can, face to face with these curds. We are going to make these curds in all these cheese factories and creameries so far as we can, and we will ask the patrons to

come in and see the milk that they are offering, and the curds that are produced from it, and to see those that are produced from their neighbors' milk and see the difference. You may tell a man that his milk is not good, he is angry, and he says, "I have got as good milk as anybody, and if this cheese factory does not want my milk, I will go to somebody else." Now, when he sees that curd and sees what his milk has produced, right beside his neighbor's that has a clean, firm, velvety curd, that has an odor that he can recognize as agreeable, and in every way right, and then takes the milk from his own herd and then gets his nose to it, it is so vile he turns away in disgust, then he will be convinced that his milk is not so good; and that is what we are trying to bring hundreds of thousands of patrons up against during the next year.

This question of the production of clean milk is the most important question that confronts us in this state today. If the cow is not clean, how can the milk be clean? We have got to study conditions for getting these cows clean, but first we have got to convince them that their milk is not clean, before we can arouse men to activity.

Ex-Gov. Hoard: I think the difficulty is that the average farmer, in the first place, does not read, and he does not travel,—neither reads nor sees, but stays on the farm, and measures himself by himself. Now, the result of it is that he gets misled.

Mr. Emery: Now, Governor, we all recognize this as an immense problem, and you have said this man won't see. Now, we are trying to get some of these men,—we cannot get all of them—to see these curds, and more, we are going to try to get them to smell of them, and if we get him to smell of them as well as to see them, we will produce some conviction. And when we have done this, we are going to do something more; we will say to them, "Now, gentlemen, we have shown you how this should be done, if you do not comply with the necessary conditions, we will prosecute you, and make you live up to them."

Adjourned until 8 o'clock p. m.

EVENING SESSION.

The convention met at 8 p. m., January 31, 1906.

The President in the chair.

Music by Industrial School Band.

Solo, by Mr. Barry Hayes, Jr.

Address by Mrs. J. Q. Emery, Albion, Wis.

THE LIVING PROPOSITION ON A DAIRY FARM.

Mrs. J. Q. Emery.

A bright, alert young woman edited the home department in a popular paper. From her office, she sent out most charming theories of how to conduct household affairs in all their complexity. In a sympathetic, understanding way she counseled wives how to manage their husbands, parents how to bring up their children, hostesses how to entertain their guests, and from time to time gave the readers of her department antidotes for family ills and discords and soothing applications for such ills as could not be permanently cured.

After a time this wise young woman married and her friends and admirers congratulated themselves on the prospect of seeing a home conducted on scientific principles, perfect in its own appointments and family relations and an inspiration and object lesson for all other homes in its vicinity. The young wife, however, greatly disappointed her royal friends and admirers who had been trying to model their homes after the pattern she gave them, by declaring at the outset that her first real work would be to clear her brain of all theories, so that there would be nothing to interfere with her enjoyment of her home and her husband in whatever way was easiest and best for them as individuals. Just think of the troubles she escaped by not trying to harmonize her theories with her actual life and not even allowing their ghosts to enter her new home.

There are many reasons why a woman actually living on a dairy farm should not undertake to discuss the problems peculiar to such a life. A little imagination and rhetoric are helpful in

telling any story, and too intimate a knowledge of facts often makes one prosy.

We have been told by some of these interesting writers in the City Offices that the farmers' life is a narrow life, chiefly made up of toil and grind and heavy work; that it is a monotonous life, a life without incident or interest; that it is often a dull, ignorant life, so restricted that it holds no possibilities for enthusiasm or culture or growth.

Before we accept these pessimistic views and inscribe over our gateways Dante's lines, "All hope abandon ye who enter here," let us take an inventory of the dairyman's possibilities for surrounding himself and his family with those things that will broaden their interests, stimulate their ambition and bring their lives into harmony with the great world about them.

A graduate of our Wisconsin Short Course, who was very skillful in the use of tools and the care of machinery, was asked why he had not fitted himself for some mechanical pursuit instead of general farm work. "Well," he said, "you know I was brought up in England. My father would have objected to having his son lose caste by being a laborer; but in England there is much dignity and importance attached to being even a small land owner and so I never considered what I was really best adapted to until it was too late."

Americans are coming more and more to feel, with their English cousins, that there is much dignity and importance attached to being even a small land owner, and men in all lines of business are trying to secure more or less farm land to be used for pleasure or profit as circumstances dictate. It is such a substantial possession, so secure and dependable, and there is something in nature's moods and aspects that appeals to almost every one.

Our real dairy farmer does not belong to that class. His farm is something more than an outside interest. It is his kingdom, where he and his family rule and take root as deeply as the trees they plant. But if he takes his landed rights more seriously, he has quite as much pride in his possession as has his city brother in his pleasure grounds.

The progressive, up-to-date farmer belongs to "Nature's Nobility" and can trace his agricultural lineage back to the illus-

trious "Father of his Country," who founded this American Royal family on the principle that "Agriculture is the most noble, the most useful and the most elevating employment of mankind."

This Dairymen's Association has met annually for years to discuss the problems its members have to deal with in their business, and to get inspiration and suggestions for advancing their interests. It has been a sort of family council where each member has contributed his share of experience and knowledge for the benefit of others. Balanced rations, comfortable and sanitary housing, suitable exercise, prevention of disease, selection of breed, weighing and testing milk, making butter and cheese and marketing them, all questions of importance to the dairymen, have been discussed in an honest, open way and the conclusions fairly arrived at seem to be, that well-bred stock, carefully housed and fed under the management of a well-bred dairyman, will yield a handsome profit to its owner; and that while the dairyman must eat his bread "in the sweat of his face," he may have it buttered to his liking.

But every member of this Association will agree that there is something of more importance on the dairy farm than the beautiful Jerseys or Guernseys or Holsteins, and that is, the dairyman himself and his family, and that conditions affecting their welfare are more important than conditions affecting only the material interests of the farm. If there is a place on earth where a comfortable home is the natural outgrowth of its own surroundings, it is on a dairy farm in Wisconsin. Drive through any dairy section of our state and you will see homes of thrift and comfort and often of beauty and elegance. These homes stand for all that is best in any home life. In one respect they stand for more than do homes in the city. They are the center of activity for the whole family. In the city men do their work in offices or factories or shops and have little time to enjoy their homes, and the wife and children cannot know so much of their work and interests pertaining as they do to outside people and affairs. On the farm the whole family is a unit and every member belongs to the Committee of Ways and Means.

To be a successful dairymn, one must be a student of dairy literature. Our own state and the United States government

are spending annually many dollars in investigations and experiments calculated to help the dairy farmer in his business. He has a wide field for study and investigation on his own farm and in his own herd. It would seem impossible for a man to use his brains in studying the quality of soils and suitable crops, of modern methods of housing and caring for his stock, of the best methods of marketing his products, and letting his mental activity stop there. A man who studies and thinks carefully on one subject is sure to broaden his horizon on other subjects. It would be as easy to keep the river from overflowing its banks in the spring freshet as to confine a thinking man's thoughts to one subject, even though it be the one that most affects his pocket-book. The successful dairyman will be very likely then to have his dairy papers and journals in close proximity to the papers and journals telling of the world's progress in other lines of thought and work. This man, engaged in a business depending for its success upon the application of scientific principles in its management, a business having a history, a literature, and men of the highest attainments and culture devoting their time and efforts to the solving of the problems it involves, cannot well be an ignorant, narrow man and hold an honored place among the dairymen themselves. He certainly ought to be the very man who would desire to secure for himself and family those things that make life broad and happy. The dairyman's family has the same intellectual needs, the same social instincts, as have people living in the city; and one of the greatest problems, here as elsewhere, is how best to minister to these needs.

There is a class of dairymen living near towns, often possessing large means, who have chosen this business for the freedom and satisfaction they get out of it. They have large acquaintances in the towns near them, and their church and social life centers in these towns. They mingle with the town's people and find their level there as followers or leaders, according to their ability or adaptability. Their children attend the town schools. They are really sub-urban residents of the town and have most of the advantages of both town and country life. Perhaps the greatest problem these dairymen have to consider is how to pre-

vent the life of the city, with its rush and excitement, from encroaching upon their rights as country people.

The large majority of dairymen, however, are further removed from social centers. They must make their own opportunities and are more dependent upon themselves for their social and intellectual development. Since Uncle Sam has sent his postman to the farmer's door, every day, with his mail, and telephones have connected the farmer's family with the neighbors, city friends and business houses, there is not so much to inspire one to dwell upon the subject of farm isolation as there used to be; and if all the trolley lines are built that are talked of, the farmer may have to give up this exclusive grievance. His city friends have already found him with their autos and made one more connecting link between them.

The dairyman's little village of homes for his family, his help, perhaps, and his stock, have the advantage of a beautiful background of forest and field and afford ample opportunity for the exercise of taste and ingenuity. Dame Nature, the kind old mother, loves to encourage her children in bringing out the beautiful qualities and attributes of her storied treasures, and seconds every intelligent effort they make to beautify their premises. As the basis of supply for family necessities, comforts and luxuries, they have the pleasure of working with live interests. It would be difficult, perhaps, to make one who has never lived on a dairy farm realize how the whole family became attached to the beautiful herds and flocks that are kept there. What a world of meaning there is to them in the names Brown Bessie, Mary Marshall, Shadybrook Gerban, Loretta D., and Yeksa Sunbeam.

One of the distinctive propositions on a dairy farm is the question of help. These dairy queens must be fed and brushed and milked and Governor Hoard and Mrs. Howie have really made us believe must be petted and caressed. It requires good, careful men to develop and handle them with profit, and such men are not always easy to find. It sometimes takes as much faith to undertake a business depending upon outside help, without a visible source of supply, as it does to run those charitable institutions that depend wholly upon popular contributions for their support. There is a limited source of supply, and that

is our Agricultural College at Madison. The young men from the Short Course may not have had much actual experience, but they have ideals as well as theories and they have not only learned many things well, but they have gotten some conception of the fact that there are many things yet to be learned. Most of these young men are preparing to take up this business for themselves and are wise enough to want to work a few years under the direction of experienced men while they are perfecting their own plans. The higher one's ideals, the better one's herd, the more systematic one's methods, the better the chances for getting the brightest and best of these young men.

There is also a large number of young men coming from European countries, who are ambitious to earn and save money, and who want to work where they can learn good methods. These men have to be taught many things, but they usually take an interest in their work and are faithful and trustworthy. Often, this help must be boarded by the farmer and whether this is wholly an annoyance or not depends something upon the family as well as upon the help. A strict business understanding as to what rights and privileges are included in "board" saves much trouble. There is often much pleasure and satisfaction in helping these young people to find themselves, and Wisconsin and Minnesota dairymen, at least, can never be quite sure that they are not helping to lay the foundations of Americanism for some future governor or statesman.

There are many ways of bringing the farmer and his family into touch with the great movements about them. President Roosevelt has called the Chautauqua Assembly, with its great reading circle and numerous smaller assemblies all over the country, "The most American thing in America." There is a farmer living in Wisconsin who has for many years rented a tent at the Assembly grounds at Madison and taken his family there. Just how he has managed to care for the crops coming on at that time and give his family this regular vacation in the busiest time of the year, I do not know, but he has done it. The tent is always there under the same old tree. A part of the family stay all through the Assembly, other members coming and going. What an education that family has received there. Every year they have had two weeks by a beautiful lake, meet-

ing people from all over the state and listening to lectures and talks and enjoying the fine music. Do they read of what Jacob Riis is doing in New York to benefit suffering humanity? They know Jacob Riis. They heard him at the Assembly. Do they read of how Mrs. Booth is trying to make the souls of prisoners free and provide for their starting right after leaving the prison? They know Mrs. Booth. Again and again have they been thrilled by her own stories of her work. Do they hear of the wonderful things accomplished for himself and his race by the great negro emancipator? Oh, yes! how they enjoyed seeing and hearing Booker T. Washington! When they read of Creatore and his Italian Band delighting large city audiences, they hear again the wonderful strains of music that flooded the auditorium and swept over the grounds, as the great master wielded his baton those sunny days at the assembly. And so year after year they have leisurely and pleasantly been in touch with the world's work and many of its workers at this Assembly and have gone home from it each year with new aspirations, new ambitions and an enlarged horizon.

It is not always those who have the most money who secure the greatest benefits for their families. Several years ago, a farmer had the misfortune to lose his home and all its contents by fire. A new house was built as speedily as possible and the family moved in, getting such furniture as they considered absolutely necessary for present needs. This furniture consisted of cooking utensils, a good dining table and chairs, beds and bedding and a second hand square piano. The piano looked rather out of place in the bare rooms, but the parents explained that their oldest daughter had just gotten where she was making rapid progress in her music and if she had to drop it then, she would lose all she had learned and possibly her interest in music as well. So they bought the old piano to use until they could replace other things and get a better one. That daughter's musical accomplishments have been a great source of pleasure to herself and her friends and have opened many doors for her that would have otherwise remained closed. Not all parents are so wise or so courageous in making choices.

Real life consists in the extent and kind of our interests.

City people plan for some sort of a summer vacation that

will give them a change and a rest from their regular duties and cares. Why should not the farmer and his family plan with equal regularity and care to leave their home for a short time each year and see how other people are carrying on the business of life,—attend lectures, concerts,—see what is being accomplished in the great centers of commerce and trade, and try to find what things there are in the strenuous life of the city that will bear transplanting to their country home, that will make it more beautiful, and more satisfying.

It is not necessary for a dairy community, however, to depend on outside agencies for all their opportunities for enjoyment and mental growth and recreation. Much of the social and intellectual life of the cities and villages is carried on through organizations—the churches, the lodges, the clubs. This is just as possible and just as desirable in the country. In many of the more ambitious cities, the men have organized clubs with a view to advancing the interests of the city. They seek to make public sentiment favorable to needed improvements. They study how to make their city attractive to those seeking places for pleasant homes and good business locations. They discuss public men and measures and reach out in all directions for the things that will help them to broaden their interests.

The women of the city, too, have their clubs. At first, they were organized simply as study clubs, a place where the college woman could brush up her history and literature, and the less fortunate woman could enlarge her horizon and learn to think quickly and speak pointedly. It was not long before these women, meeting regularly for study, began to feel the inspiration that comes from sympathy and co-operation, began to want to use their growing influence and strength for things not pertaining so directly to themselves. So they joined hands in trying to better things about them. These women through their club organizations are raising the standard of life for their own members, and because of their better knowledge and keener sympathies are more and more influencing public policy.

Country people have just as much need of this club life, this co-operative work, as have the town's people. What could be more enjoyable than for the farmer's families to organize a club to meet one evening each week in winter; the object of this club

to be to promote the social and intellectual welfare of its members and to consider and formulate plans for improving their surroundings. Do you suppose there would be many dull, ignorant people to be found in such a community after they had once tasted the joys of studying subjects of interest to themselves and their neighbors, with a view to sharing their knowledge and conclusions with those neighbors? There is no quicker way of learning that there are many sides to a question than to have it discussed by people who view it from different standpoints. City organizations discuss among other things, how to improve their streets and transportation facilities—the very things the farmers should consider. Why not have that long street in the country made beautiful by being kept free from weeds and brush, having trees planted for shade, an attractive approach made to each homestead, lawns graded and clipped and the name of the farm attractively placed where it could be seen at a glance. If there is a careless, indifferent man on the street, who does not care how his premises look, get after him, in a diplomatic way of course, appeal to his pride, if nothing else will do it, try to make him realize that his farm will be worth more money if it presents a good front to the world. Country air is sweet and invigorating, but the morning and evening dew and the dust or mud and the long grass and weeds by the roadside, make the highway anything but pleasant for a walk, if one cares for neat appearance. If all would work together it would be very easy to have a gravel walk from farm to farm in the more thickly settled districts of Wisconsin. If, after a good foundation was laid, this enterprising community should find a way to cement their walks, both private and public, and should employ the best methods of road making for their particular locality, they would only be giving themselves some of the legitimate pleasures and conveniences of country life. There are just as many ways of making country homes and streets beautiful as there are city homes and streets, and a very good place to create and strengthen public interest in them would be in such a club. It has been truly said that “There is nothing sentimental in affirming that the love of beauty can go hand in hand with toil, and that true art transfigures labor, giving it the dignity of the individual’s chosen tasks performed with joy;

and without such joy, labor sinks into the lethargy of the plodding ox, or worse, is performed as by a machine instead of a living being."

Another subject of vital interest to every country resident, is the country school. Specialists and leaders in the educational world are recognizing that boys and girls in the country must have better opportunities for education—must be provided with schools that will prepare them for college or business life. Why not, in this club, investigate their plans for the consolidation of schools, for industrial education and the methods by which they propose to teach the elements of agriculture to the country school children. And while the powers that be are settling the questions of a "square-deal" for the country schools, in a large way for the whole state, this country club could be finding in what particular ways they could make improvement under present laws and conditions. They could make sure that the school house was well lighted, well warmed and ventilated; that the building and grounds were made attractive and kept in a sanitary condition; could see that they were getting the best possible results from the library fund; and most important of all, they could create a sentiment, favorable to investing enough money and enough time in careful selection to obtain a good, strong teacher, who would arouse interest and enthusiasm among the children for their school work. There is no law requiring country districts to be experiment stations for inexperienced or partially prepared teachers. The place for an inexperienced teacher would seem to be in a school supervised by a competent principal. Teachers in town high schools where country children, under present conditions, go for their next step on the educational ladder, find that pupils from different schools vary very much in their ability to master the work of the high school. Many do not even know how to study. Others are self-reliant, ambitious and competent. Every country boy or girl whether living on the street beautiful or in tumble down lane, should have the opportunity and be made to feel the necessity of acquiring a clear, concise knowledge of the subjects included in our course of instruction for country schools, and that too under the direction of a teacher who can arouse their ambition, teach them

habits of industry and application and lay a solid foundation for what is to follow.

A few years ago, an ambitious, conscientious young man taught a country school in a district where there was a large foreign element. One of the little boys, whose grandfather and grandmother could not speak a word of English, showed much ability. The teacher took this boy in hand and finding that he responded to every effort, impressed on him the fact that his future could be as successful as he chose to make it. The boy finished the country school course and under the inspiration and by the advice of the teacher went to one of the best city high schools in our state, where he not only carried his work and graduated with honor, but most of the time, worked for his board that he might stay in school. He is now a student in the engineering course in our state university and has his country school teacher to thank for the stimulating and moulding influence that sent him onward to the bright prospects before him.

These are only a few of the local subjects that might be combined with outside study, in a program that could furnish opportunity for social relaxation and mental stimulus as well as serving to make common interests of the things affecting that community as a whole.

We are not forgetting, in suggesting this winter evening club for the family, the great advantages which the woman's club offers the women in the country. One of the most honored club women in the United States, returning from a visit to the Orient, is enthusiastic over the renaissance of Japanese womanhood. In speaking of the great progress made by Japanese women in the last few years, she says that many of the christianized women intent on self-improvement are encouraged by their husbands and fathers to organize women's clubs to help them to prepare for the broader life that is to be their privilege in the new Japan. They have, so soon, learned that it is not what we get, or what we keep, but what we share that makes us strong. Some one has said "Human beings cannot exercise the full powers of their minds in the exclusive contemplation of their own affairs," and the country home-maker will be a happier, more resourceful woman, if her interest is occasionally taken outside

of her own individual life and its surroundings and brought into unison with other lives and their needs.

But, says the objector, how is this busy house-mother to leave her home and attend club meetings that must necessarily be held in the afternoon? Just as she leaves her home to attend bargain sales, picnics or parties. Mrs. Decker, president of the General Federation of Women's Clubs, says, "The club is to teach us to stay away from home with good results."

A gentleman whose business took him away from home a good part of the time, remarked, after his wife and daughter had for sometime been members of a Woman's Club, that formerly when he came home, he heard of all the little happenings of his own household and those of his neighbors'; but since the wife and daughter had belonged to the "Current Topics Club," he found quite a different atmosphere in the home, and was greatly pleased by the change from unimportant personalities to a keen interest in the great human family and a growing understanding of the world's work along different lines.

While joining the city club women in looking after child labor, the consumer's league and a host of other important topics, these country women could step aside a little and unite their efforts to lessen the labor in their own households. In a certain farming community one of the greatest drafts on the house-wife's strength is greatly reduced by an understanding in the neighborhood that on all occasions requiring exchange of help, such as threshing, filling silo, shredding corn, etc., each man is to go home for his supper, leaving the housewife only the dinner to prepare for the large number of men. To this might be added co-operative laundry work. These women might counsel how to make it an object for a good dressmaker to make the rounds of their families and save them much time used in going to town for such work; how to secure extra help in busy times. It is really much easier for an organization to accomplish things than for an individual to do so and in the end these busy women might succeed in lightening their burdens till the whole family could be treated to a larger social and intellectual life.

Last spring at the meeting of the First Wisconsin District Federation, a delegate reporting for a large city club, said they had invited several country friends of their members to join

their club and had so enjoyed the result that she recommended this policy to other clubs. There are many advantages in joining a club that is well organized and has learned to conduct its meetings according to parliamentary usage and get the greatest possible good out of them; and there is much pleasure and profit in meeting people outside one's own immediate circle in such a friendly fashion,—but not all country women can join such a club, and the country woman's club can grow to as full stature as the city woman's club, if it be as carefully nurtured; can join the federations and have the help of their committees in arranging programs for study and work; can have the use of papers, art portfolios, maps and charts; can attend the meeting of the federations, and we have the word of a good club woman that there will be no better, more original or more interesting papers and discussions than the country club woman will contribute.

A little boy writing a composition on the country, says, "It is the place where everything grows and every one is happy." Whether or not this be true of every one, it is true of the children. They enjoy country life without question or reservation. Who ever saw a normal child in a well ordered country home, that was not happy and enthusiastic in his love for his home and its surroundings? Where such pets, such an opportunity for even the little ones to share in the duties and pleasures of home-life? A gentleman interested in establishing and maintaining gymnasiums for city children tells us that what a boy does with his muscles affects his character and the boy in the country learns what he can do with his body without formal instructions. He vaults fences, swims, hunts, shoots, masters dogs and horses, and after a rough fashion, but a very effectual one, learns self-control and discovers his own resources. His sister has equally happy chances to grow into strong healthy womanhood.

In summing up the record of the closing year and the forces at work at home and abroad, a writer in a recent number of a popular monthly says: "The increasing love of the country as distinguished from the town must be regarded as one of the most significant and helpful facts of our time; and it continues to spread. . . There is an increasing number of books on

trees and flowers and the garden and animals and all the outdoor world; and these work for the strengthening of the Nation's fibre." It is pleasant to note that this "love for all the outdoor world," which has been the determining factor in most dairymen's choice of their life work, is spreading more and more to the people of the world at large. It promises a better understanding between country people and city people. It promises a new outlook for the city home and an added grace and beauty for the country home. This increasing number of books on trees and flowers and the garden and all the outdoor world will be shared by country lovers everywhere, whether they minister to the day dreams of the business or professional man in the city or foster the pride and increase the love of the country man for his surroundings.

And the two are not so far apart after all. The men who have contributed most to our national life have been lovers of the country. "One letter about farming is worth ten about politics" wrote Daniel Webster to the superintendent of his Marshfield farm.

"I would have been a farmer had any science of farming been known to those among whom my early life was passed," said Horace Greeley.

Oliver Wendell Holmes, who "peopled his Pittsfield farm with trees," wrote to a friend, "I have one particularly pleasant remembrance about my place, that I, in a certain way, created it."

William Cullen Bryant wrote to his brother, "Congratulate me, I have bought forty acres of solid earth at Hempstead Bay."

Mt. Vernon stands in the background of Washington's life as does the Hermitage in that of Jackson's.

"Only a judgement-day-roll-call," it has been said, "can number the vast proportion of distinguished Americans who have carried in their hearts the love of some country home."

The more we know of conditions on a dairy farm in Wisconsin and the real questions of life there, many of them perplexing and difficult, many of them refreshing and delightful, the more are we impressed that the living proposition is largely a matter of individuality and choice. It does not follow because it is possible for the dairy farmer to have fine stock, good buildings,

modern conveniences for himself and his family, a pleasant home with beautiful surroundings, books, music, pictures, those things that make home life attractive and pleasant, that he will have them. It depends upon what kind of a man he is, what the ideals of the family are, how much ambition, courage, perseverance they have, what life means to them, sometimes there are limitations that cannot be controlled; but if the spirit of progress and right living is there, it will manifest itself in some degree.

A beautiful new magazine devoted to American farming has on its title page, this quotation: "Farming is a profession requiring more shrewdness than law, more technical training than medicine, more uprightness than theology, more brains and resourcefulness than pedagogy. It is its own reward." The professional dairyman then, it would seem, has something to live up to. If he is to succeed in his profession and be worthy of it, he has something to do. He must study nature's laws that he may work in harmony with them. He must study the needs of mankind that he may minister to them. He must be honest with himself and his fellow men. He must study how to get the best and sweetest results from his environment; how to make his home beautiful, restful, inspiring to his own family and the friends who share it with them; must embrace every opportunity for himself and family to broaden their views, enrich their lives and come in contact with the great forces about them. Such dairymen and their families will have a standing in the business world and in the social world. Their lives will be full of rich experiences and they will count their gains, not wholly by extended acres, increased herds, expensive improvements, but in a larger way, by their opportunities for enjoying the better things of life and being able to contribute their share of intelligent progressive work to the factors that are tending to "strengthen the nation's fibre."

Music, Hayes Quartet.

THE LIBRARY IN THE RURAL SCHOOL.

Miss Julia Rockafellow, County Superintendent.

It is the business of our democracy to do more than protect the citizen from injury, more than assure legal equality of right and opportunity to all. Such a political organization as ours is bound by its very constituent elements to use the common power to provide the means which will enable everyone to make the most of himself; to fill *all* with a sense of gratitude which will impel them to do what they can to help the whole mass forward. These are the ideas which are more or less developed throughout the land.

They are the ideas which have resulted in an educational system, resting very generally upon public but somewhat upon private foundations. This system is essentially American and as such possesses some of the faults of American character, the greatest of which probably is the tendency to overdo. Our system may not do some things so well as that of other people but it does many things for all the people very much better than any other system does them. It not only trains the youth of our nation in practically every direction of intellectual activity, but the development of it, the support and care of it have brought untold advantage to our nation itself.

These popular ideas have given rise to distinguishing tendencies which have become so well ingrained as to be our educational policy. We believe that there can be no seasoned and hardened education without work. We are seeing that all kinds of work make for learning, steadiness and power. We realize the influence of actual accomplishment upon the making of a man no matter in what field it be achieved. These ideas have changed the standard of our schools. Earnestness, not fortune; power and endurance, not culture; ability and willingness to labor, have weight in shaping the purposes of our schools.

We believe in freeing the teacher from bias and undue influence thus exacting from him a better preparation for teaching. We believe in a closer unity of purpose between all classes of schools.

Culture has been the slogan of recent years. It is important, but strength is still more important. It is desirable, but it is still more desirable that boys shall be trained to bear the part of a real man, and the girls the part of a real woman. The leadership of a few tireless workers, such as the president of these United States, has done much to start a healthful reaction.

The education gained at school must, with the great majority of people, be meager at the best. This may be and should be supplemented by reading after the school life is ended. If it is the duty of the state to see that its citizens know how to read, is it not certainly no less its duty to see that they are trained to do the right kind of reading? Otherwise the ability to read may not only be harmful to the individual but a menace to the state.

If our education is the work of all our years; if it is not only for the young but for adults as well; if it is for life and not for a course; if it is to be carried on at home as well as at school, to be taken up in the hours or minutes of leisure as the proper accompaniment of our day's toil; if, as we believe, the welfare of the state depends upon the kind of thoughts nurtured in the minds of all, and these depend upon the reading done or not done; then education must be largely carried on by reading after school life is ended and the school must supply the readers. This, then, is the task set the modern school—the task of not only teaching the pupils how to read but a greater one—of leading them to love good reading so well that in all their lives thereafter they will seize every opportunity to read it. This is the central thought toward which our American methods have been unconsciously guided. It is the one thing which the school may do which continues to contribute to one's education so long as he lives. The home, in some instances, is doing more than the school, but it is the school, after all, in the great majority of cases, which must give the children this taste for good books and an introduction to their proper use. As great even as a good book is, the power to communicate to another the love for one, to win children to this, to lead them to appropriate to themselves ideals from characters in books, to deepen and enrich their emotions by suggestion—in other words, to so read a good book into a child that he is bound in some way to live it out in himself, is the teacher's privilege, the hope of which alone is enough to sweeten the days and weeks of unseen and never to be acknowl-

edged drudgeries of the school room. To make possible this privilege to the teacher, to make possible the attainment of one of the highest purposes of our schools, to foster the welfare of our people, yea, to help make enduring this government of the people, by the people, and for the people, libraries were placed in our Wisconsin schools. True it is that these libraries in the rural schools are small and inadequate, but, under the management of our skillful teachers, many desirable beginnings of this great work are being made.

Statistics have shown that the greatest amount of reading during common school age is done between the ages of 12 and 14. Soon after this the reader settles down to one class of reading. To begin then with the 12-year old in the selection of the books for these libraries is too late to attain the results we wish to see. In our rural schools there are, therefore, books for children of all ages, reference books and a few books for adults.

Now that we have them, some may wonder what use we make of them. In order to show only a few of the many ways we use them I want you to go with me in imagination to a few of the schools in this county. For the purpose of this discussion we will omit all matters pertaining to school visitation except those bearing upon this question—the use of the library. 'Tis on a Friday morning. As we enter the hall we hear a class being drilled upon the pronunciation of words. We discover, after entering, that it is a 3rd reader class. Having completed the word drill, various members are called upon to tell the story of the lesson. We discover that it is about George Washington and it is a biography, but not of the cherry tree and hatchet kind nor of the encyclopedic kind, such as we read when we went to school. No, it is one especially written for children, but equally interesting to us. There appears to be but one book for the use of the whole class—a library book. After the work of the study period has been tested, as shown in the telling of the story by the children, the work of orally reading the lesson takes place. This is as well done as you or I could do it. Then, as the time is not gone, the teacher says that they may tell what they remember of Lincoln, who was the subject of study a short time ago. Everyone is eager to tell something. As they relate the struggles of his childhood the cheeks glow with pleasure and in the eye you

see a flash telling us of their deep interest in those struggles which made Lincoln such a power when we needed strong men.

Upon inquiry we find that the one book is placed where all can have access to it at any leisure moment during the week. Upon Friday, the lesson occurs as we have seen it. Who can measure what good may result from such study of the lives of great men and women? Who can tell how many of those boys and girls caught an inspiration to live upright, honest, strong lives? The years to come will unfold the results.

Incidentally those pupils were forming habits which ought to be of great service to them in later years. They were required to step out in front of the class and tell to the class their thoughts. How many of us wish we had been trained so that in such meetings as you have held today we might have the confidence to stand up and ask a question pertinent to the discussion or utter some opinion which is burning within us for expression. This work with books gives our pupils thoughts. It is for the teacher, then, to so conduct the recitation that the pupils gain the confidence to utter them.

Upon the wall near a corner of this same school room we find a large number of pictures of the Pilgrim and Puritan days, and on a shelf underneath we see a portfolio on the cover of which we find a copy of that well known picture of John Alden and Priscilla—and the inscription, November, 1905. We will look within. We find a number of compositions. We glance through these and find that one set tells of the Pilgrims—their persecution, their dwelling in Holland and their voyage to America. Another tells of the first Thanksgiving. Upon inquiring we are told that during November the children read whatever they could find in the library concerning the Pilgrims and Puritans. This material was arranged by means of oral reproduction exercises into groups so that various phases of their life was finally worked out. Having this material thoroughly in mind the children were allowed to put their stories into written form upon paper of uniform size and quality. Of course it is plain that these children are getting the foundation for a formal study of history. When their minds have become stored with historical stories and biographies such as I spoke of a few moments ago, history ought not to be a dry, unreal subject.

And so I might go on taking you into schools at different seasons when Hiawatha, the little Indian boy, his people and Indian corn, or the Eskimo, or some other topic would be similarly treated. Similar work is done in preparation for the texts in geography. Later in the courses the pupils themselves hunt out all there is in the library or elsewhere to supplement the work in history, geography or civics. In fact, the libraries do not as yet furnish enough copies of some of these information stories, as for instance, the geographical readers by Carpenter. The teacher's ingenuity is severely taxed to plan, then, so that all may have access to what is desirable.

But some one is thinking of the little ones. What do you do to get them to love to read so that when they have acquired the art of reading, they will read? They are told myths, fairy tales and folk stories because they love them so. This is the age when they live in imagination; a crooked stick becomes a galloping horse to the boy; a bundle of cloth, the handsomest human being to the little girl. So when the teacher tells them the stories in which animals and trees talk, they are only listening to their own thoughts put into form. Nothing is too wonderful for the imagination of the little child. This gives the wee ones material for thought. There is a natural desire on their part to tell and talk about anything which has made an impression upon them, so upon our visits we will find them telling these stories to their classmates as did the older ones relate the biography of Lincoln or Washington. If the teacher be one who can lead them by a few suggestions we shall find them acting out many of these stories—one child for instance will be the Big Papa Bear—another, the mamma bear—another, the wee bear—and a fourth, little Goldenhair. Then the portions they tell will be what these characters in the story say, accompanied with the supposed actions of the same characters. But we also have animal stories for them which are real, and hero stories which are founded on fact, so that they do not live wholly in the fancy world. Then we have poetry for them and it will not be unusual to find these little ones able to recite many beautiful memory gems, and whole poems; such as, "The Raggedy Man," "Boy Blue," "Sweet and Low," "Barefoot Boy," "Come to Me, O, Ye Children," or "The Children's Hour." Having

learned something which is especially pleasing to them they often inquire who wrote it. When told—will come the question—“Won't you tell us something about him some day.” Especially is this true if the teacher is skillful in planning her work and so has introduced them pleasantly to this work. Of course the teacher is glad to tell them something of the author, for she knows that when one has a desire to learn anything he does it easily and the impressions made are more lasting. So some day when we call again at the school they may take especial delight in telling us that Whittier was himself the Barefoot Boy, or that the girls in the “Children's Hour” are Longefollow's own daughters; as well as many other incidents of these masters' lives equally interesting.

We have poems too for the older pupils, but I will not take much of your time to speak of these. In this work, however, the pupil must *feel* what is described, he must *imagine* the pictures and obtain a *sense* of the depth of meaning contained in the poem, else his character or taste will be little affected. It is obvious that the pictures will be most vivid in the minds of those pupils who have had their imagination trained as I have just outlined for the younger ones, hence the double importance of this work in the early years.

We have another and entirely different line of work for all the pupils. I refer to the study of things surrounding the country boy and girl in wood and field, on the farm and in the home, till he comes to know the birds and their usefulness to the farmer, the common trees, the domestic animals, the poetry of the farm, the clouds, the air, the winds, the flowers and the fields. Recently we have added books upon elementary agriculture, hoping thereby to arouse the interest of the boys and girls in saving some of the waste upon the farms as ordinarily conducted, in improving roads, in seeing other phases of life on the farm beside that of drudgery.

Our libraries contain a few books for the adults and will contain more of them as the years come and go, for the present generation will use them when they have attained that age if our work in the schools is not without results.

All the books are now accessible during school months to all residents of the districts, and if the law were followed they would be accessible during vacation times.

In some schools we have the cleanest and purest periodicals; such as, "The Little Chronicle," or "The Pathfinder." These give the current news of our country and of foreign lands in an unprejudiced manner.

I have shown only a few ways by which we attempt not only to teach the children *how* to read but to *love* to read. The country schools have every advantage so far as material means are concerned; their environment is rich in organic and inorganic forms; the pupils can be individually known by the teacher; but in one thing they are lacking—the supply of teachers who can utilize that which offers itself in abundance. This is the want which every thoughtful person deplures, a want that will be met when the farmers themselves realize what a wonderful influence for good their schools may be made.

Music by Industrial School Band.

MORNING SESSION, THURSDAY, FEBRUARY 1, 1906.

Convention met pursuant to adjournment at 10 A. M.
President Hill in the chair.

FEEDING THE DAIRY COW FOR PROFIT.

A. J. Glover, Ft. Atkinson.

If I should say to you that I am delighted to meet with the dairymen of Wisconsin it would be only repeating what has been said to you, I presume, a great many times. I highly appreciate the privilege, because I know the high regard in which this association is held by dairymen in all sections of the United States. Notwithstanding, I have never attended a dairymen's meeting in Wisconsin, yet I owe much, in many ways, to the Wisconsin dairymen.

It was fourteen years ago last fall that a Wisconsin dairyman, who had also been both a student and instructor in the Wisconsin Dairy School came to the Minnesota Experiment Station and Agricultural School. I was a student in that school, and the person who came from your institution and who is now one of the leaders in dairy science, was my instructor in dairy husbandry. During the seven years which I spent in that institution there was no time that I was not connected in some way with the dairy department, and Prof. T. L. Haecker was my teacher and adviser. If I should drift too far, this morning, from the teachings of this association, remember that it is seven years since I left my alma mater, and I have come in contact with many practical cow keepers who are not in full accord with the teachings of scientific men. Bear with me then till the close of my talk and then I shall be at your mercy.

There is probably no question that is any more perplexing than the subject of feeding the dairy cow for profit. It is not enough to state the kind and amount of feed to give, but we must take into consideration the individuality of the animal, the amount of milk she is capable of giving, her care, her environment, her breeding and her owner. It is a dairy bred cow to be sure that we shall have under consideration, but there is a great difference in dairy cows, not only in the production of milk, but in disposition and otherwise. It is a well known fact that breeding for a special purpose tends to develop an animal that will be in harmony with her function. The dairy cow whose function is to make milk and who has for generations been bred for that purpose does not retain and carry as large an amount of flesh and fat as the beef animal. This is due to the fact that her energies and those of her ancestors have been turned to the production of milk, and flesh has been made subservient to that function. Because of these different functions, the dairy animal tends to become spare and angular, while the beef cow tends to become square and blocky. Temperament governs form, and form governs functions. The dairy cow does not need very much meat or fat on her back in order to perform her function of making milk. If she carries much flesh it is an indication that she will consume a large amount of feed for the milk produced. In other words, the cow that carries more flesh and fat than are

needed to indicate a thrifty condition is using more feed than she ought to for maintaining her body. The cow is not always to blame for this condition,—the feeder is sometimes over anxious to see his cattle look fat and sleek and feeds them more grain than they are capable of manufacturing into milk. This practice is more or less injurious to the cattle and it is a costly luxury. It is the observing feeder that watches these conditions and does not feed any animal more than she will consume economically.

A MAINTENANCE RATION.

Every living creature requires food to sustain life, whether it works or not. The loafing man eats; the resting horse consumes a certain amount of feed; and it is none the less true of the cow. The steam boiler requires a certain amount of fuel to maintain the steam to a given pressure when it is not working.

The cold air which surrounds it is constantly cooling the water, and in order to keep up steam some fuel must be added. In animal life the surrounding atmosphere is constantly cooling the animal's body and to maintain the body at a normal temperature, feed must be constantly added. Moreover, it takes a certain amount of feed to supply energy to do the work the animal has to perform in extracting the nutriments from the feeds and to carry them to the different parts of the body. The fuel which the boiler requires to keep up a given pressure of steam corresponds very closely to the feed that the animal demands to sustain life, and bodily health, without gaining or losing in weight. The feed thus used is called the maintenance ration.

THE WORKING RATION.

Where an animal is fed enough to support her body properly, and the steam boiler is given enough fuel to raise and sustain a given pressure of steam, if either is required to do more. to exert additional energy, each must receive more fuel. As soon as the engine is started it begins to take the stored up power from the boiler and transmit it into active energy. The boiler will supply steam for sometime to the engine without the addi-

tion of fresh fuel, but the time is short, and, if continued power is needed, more coal must be added to the fire. The harder the engine works, or the more steam that is used, the more fuel will the boiler require. It is just so with the cow,—for as soon as she begins to produce milk she requires more feed, and the more she produces the more feed she will demand. There is a limit, however, to the amount of work that can be done in either case.

For instance, if the boiler is only ten horse power and there is a demand for twelve horse power, it will be necessary to crowd the fire with coal and increase the draft in order to produce the extra amount of energy. Every engineer knows that this is a wasteful way of producing energy. It is not only extravagant, but the boiler lasts only a short time when it is crowded to and beyond its capacity. It is generally understood that any piece of machinery should be stronger and capable of doing a little more than it is required to do under ordinary conditions. The cow should have the capacity of producing more milk than she is called upon to produce in ordinary herd work. It is not profitable, as a rule, to force a cow to the limit of her capacity. She should be fed all the feed that she will economically convert into milk, and at the same time retain her health and produce a strong calf. The working ration therefore does not mean crowding the machine continually to its normal capacity and sometimes beyond, making it short lived and the cost of production unnecessarily high, but rather a ration that keeps the animal in good physical condition, produces a strong calf and gives the most economical flow of milk.

A BALANCED RATION

is the proper amount of feed to sustain the animal for 24 hours and supply her with ample nutrients to do her work economically. In calculating a formula for a balanced ration there are no hard and fast lines to follow. We have tables, to be sure, that are based upon the results of experiments; they are helpful in calculating formulas for rations, but they cannot be followed to the letter, or we will make serious mistakes.

A few years ago, I was on an institute tour through the Red River Valley of Minnesota, and I advocated the balanced ration

as it was taught to me in school. In other words, I formulated a ration for a cow weighing 1,000 lbs. containing from 2.25 to 2.50 lbs. of digestible protein, 12 to 13 lbs. of digestible carbohydrates and .75 lbs of digestible fat.

The next winter I visited many of the same places and I found from the questions that were asked and through the discussions, that very few farmers had increased the flow of milk by feeding the ration that I had proposed to them the preceding year. What was the trouble? After investigating and considering the subject I discovered that the cows to which this ration was fed were not dairy cows, nor kept under dairy conditions. It was a waste of good feed for men to give so much to a class of cows that were not bred for dairy purpose, nor cared for, by men who had any knowledge of handling dairy stock. If I had told them first to put their cows in a warm, well lighted and ventilated stable and give them all the hay they would consume and from four to five lbs. of ground feed, I would have given them information that would have started them on the way to become successful dairymen, but a ration containing from ten to twelve lbs. of concentrates and roughage accordingly was altogether too much for a cow housed in a poor barn and giving from five to ten lbs. of milk per day. A balanced ration is correct enough, but it must be balanced to meet the conditions for which it is fed and according to the amount of work that the animal is doing.

FEEDING ACCORDING TO YIELD OF MILK.

There is no better system of feeding the dairy cow than to give her a ration according to the work she is doing and to nourish properly her body. Let us be specific in order to illustrate clearly this point: Supposing we have 1,000 lb. cow that is giving 25 lbs. of 4% milk daily (or is capable of doing this without crowding), and there is on the farm clover hay, silage and corn which is worth \$13.00 per ton and barley worth \$18.00. In the market we can purchase bran for \$16.00 per ton; gluten feed for \$25.00; oil meal for \$30.00. In calculating the amount of feed necessary we first refer to our table to see what kinds and amounts of nutrients are required, on the average, for a dairy cow weighing 1,000 lbs. and producing one pound of fat per day. We find that it requires about 1.8 lbs. of digestible protein,

12.00 lbs. of carbohydrates and .5 lbs. of fat. The next question is: what combination of the named feeds will supply these nutrients the cheapest? We know from experience that corn silage and clover hay are good feeds and furnish nutrients at a reasonable cost. An allowance of 40 lbs. of silage is none too much for a cow weighing 1,000 lbs., and in 40 lbs. of silage there is 10.6 lbs. of dry matter containing .53 lbs. digestible protein, 5.6 lbs. of carbohydrates and .28 lbs. of digestible fat. An animal of this size will consume in addition from five to ten lbs. of clover hay, consequently, we will suggest that seven lbs. of clover hay be added to our formula. In seven lbs. of clover hay there is 5.9 lbs. of dry matter containing .48 lbs. of digestible protein, 2.51 lbs. of digestible carbohydrates and .12 lbs. of digestible fat. By adding the total amount of nutrients in the silage and clover hay together we find that we have 16.5 lbs. of dry matter containing 1.01 lbs. of digestible protein, 8.11 lbs. of digestible carbohydrates and .40 lbs. of digestible fat. So far, our ration does not contain enough nutrients to support the cow and make one pound of fat, or 25 lbs. of 4% milk per day. The question may come to you, why not increase the silage and the clover hay, till enough nutrients are supplied, for these feeds are cheaper than mill stuffs. A cow cannot eat enough of these feeds to produce the most economical flow of milk, unless the prices of milk feeds are exceptionally high and the price of butter fat comparatively low. Under such a condition it might pay better not to feed any concentrates, but feed all the silage and clover hay the animal will consume without waste. She will probably keep up in flow of milk for a short time by drawing from her system the stored up energy that she created when dry, just as the boiler with a pressure of 150 lbs. of steam will run the engine for a short time without putting in coal enough to supply the engine with all the steam that it will use to advantage. The cow, like the engine, will adjust her work to the amount of latent energy or feed that she is given. Therefore, under ordinary conditions, some grain should be added to this ration.

Experience and tables which have been tabulated from the results of experiments show that from seven to eight pounds of grain will have to be added in order to supply the cow with ample nutrients for doing her best work. What grains shall be added? In our silage and clover hay there is 16.5 lbs. of dry

matter containing 1.01 lbs. of digestible protein, 8.11 lbs. of digestible carbohydrates and .40 lbs. of digestible fat, and we need for this cow about 1.80 lbs. of protein, 11.94 lbs. of carbohydrates and .47 lbs. of fat, or there is needed the difference between the nutrients in the silage and clover and the amount required; which is .79 lbs. protein, 3.84 lbs. carbohydrates and .07 lbs. of fat. Since we have learned from actual feeding experiments that corn has about the same feeding value as barley and one can be substituted for the other, it is only business like to note which is the cheaper. Corn costs five dollars less per ton, which makes considerable difference for feeds so nearly alike in feeding value. This indicates that it often pays to exchange some home grown grain for mill feed. How is it to be determined that barley or corn or any other feed stuff is needed at all? This is largely ascertained by chemical analysis and digestion experiments, the results of which are combined in feeding tables found in books and periodicals and is one of the many illustrations of the benefits conferred upon the farmer by science and scientific investigation. Whenever clover or alfalfa is fed it requires at least half of the concentrates to be rich in carbohydrates and comparatively low in protein. We take 4 pounds of the corn chop, for I said we needed from 7 to 8 pounds of concentrates. In the four pounds of corn chop there is 3.6 lbs. of dry matter containing .32 lbs. of digestible protein, 2.67 lbs. of digestible carbohydrates and .17 lbs. of fat.

Corn chop is a heavy feed and since a ration for a cow should be made bulky, a rather light feed ought to be added. I have assumed that bran is worth \$16.00 per ton, gluten feed \$25.00 and oil meal \$30.00. In order to determine the total amount of nutrients that is already in the feeds which have been chosen, it is well to put them in table form and the formula so far is as follows:

Feed stuffs.	Dry matter.	Protein.	Carbohydrate.	Fat.
	Lbs.	Lbs.	Lbs.	Lbs.
Silage, 40 lbs.....	10.6	.53	5.60	.28
Clover hay, 7 lbs.....	5.9	.48	2.51	.12
Corn chop, 4 lbs.....	3.6	.32	2.67	.17
Totals	20.1	1.33	10.78	.57

This supplies enough nutrients for a cow weighing 1,000 lbs. and giving 15 lbs. of 4% milk, but not enough for an animal producing 25 lbs. of 4% milk. The cow may for a time produce more than 25 lbs. of milk on this amount of feed, but she will draw on her system for extra nutrients and will, in time, decrease abnormally fast in milk flow. To make this ration complete for the cow in question we need about a half a pound more protein, a little more than a pound more of carbohydrates. In four pounds of the gluten feed we have .93 lbs. of digestible protein, 2.03 pounds of digestible carbohydrates and .11 lbs. of fat. This amount of gluten feed furnishes more nutrients than are needed, so let us try three pounds, and we get the following: .70 lbs. protein, 1.52 lbs. carbohydrates and .08 lbs. of fat. This would do very well but it gives a little too much protein and costs a little more than four pounds of bran which has 3.5 lbs. of dry matter, containing .50 lbs. digestible protein, 1.54 lbs. of digestible carbohydrates and .12 lbs. of fat. This gives the proper amount of nutrients needed to balance the ration for a cow weighing 1,000 lbs. and producing 25 lbs. of 4% milk. It gives the following formula:

Feed stuffs.	Dry matter.	Protein.	Carbohydrates.	Fat.
	Lbs.	Lbs.	Lbs.	Lbs.
Silage, 40 lbs.....	10.6	.53	5.60	.28
Clover hay, 7 lbs.....	5.9	.48	2.51	.12
Corn chop, 4 lbs.....	3.6	.32	2.67	.17
Bran, 4 lbs.....	3.5	.50	1.54	.12
Totals.....	23.6	1.83	12.32	.69

If the animal produces more than 25 lbs. of milk add one pound of the grain mixture for each three lbs. increase in milk.

It is probably well to consider a ration made up of timothy hay and corn stover for roughage in order that we may note the kind of concentrates that will have to be selected to supply the proper amount of nutrients to a cow producing the same amount of milk. I will not go through the process of formulating this ration but I will give the formula which is as follows:

Feed stuffs.	Dry matter.	Protein.	Carbohy- drates.	Fat.
	Lbs.	Lbs.	Lbs.	Lbs.
Timothy hay, 10 lbs.....	8.7	.28	4.34	.14
Bran, 3 lbs.....	2.6	.28	1.06	.09
Gluten feed, 2 lbs.....	1.8	.47	1.14	.05
Corn chop, 2 lbs.....	1.8	.17	1.33	.09
Oil meal, 1 lb.....	.9	.29	.33	.07
Totals without stover.....	15.8	1.59	8.20	.44
Corn, stover, 10 lbs.....	6.9	.17	3.24	.07
Totals.....	21.8	1.76	11.44	.51

Corn stover as a rule is fed ad libitum but I have shown the amount of nutrients in 10 lbs. This makes a ration nearly as well balanced as the one containing clover hay and silage, but it is not as good a ration, notwithstanding it contains more expensive concentrates. It lacks a succulent feed which is much appreciated by the milch cows. Moreover, timothy hay is not as good as clover when there is an abundance of corn raised.

It is perhaps well to compare the composition of clover hay, timothy and alfalfa in tabular form in order to see why timothy is not a good hay where there is plenty of corn, and why alfalfa is such a very valuable hay for all kinds of live stock. In the following table we have shown the amount of digestible nutrients contained in 100 lbs. of timothy hay, alfalfa and clover.

	Dry matter.	Protein.	Carbohy- drates.	Fat.
	Lbs.	Lbs.	Lbs.	Lbs.
Timothy hay.....	86.8	2.8	43.4	1.4
Clover hay.....	84.7	6.8	35.8	1.7
Alfalfa hay.....	96.6	11.0	32.6	1.2

Clover hay contains about $2\frac{1}{2}$ times as much protein as timothy, and alfalfa 4 times as much. In 100 lbs. of corn there is 89.1 lbs. of dry matter containing 7.9 lbs. of digestible protein. 66.7 lbs. of digestible carbohydrates and 4.3 lbs. of digestible fat. Since corn contains such a low per cent of protein and a high

percentage of carbohydrates it goes well with alfalfa, because it is richer in protein and contains much less carbohydrates. Let us make a ration of alfalfa and corn for a cow weighing 1,000 lbs. and giving 25 lbs. of 4% milk.

	Dry matter.	Protein.	Carbohydrates.	Fat.
	Lbs.	Lbs.	Lbs.	Lbs.
18 lbs. alfalfa.....	16.5	1.98	7.03	.22
8 lbs. corn chop.....	7.1	.63	5.34	.34
Totals.....	23.6	2.61	12.37	.56

Corn and barley are about the only grains that will make a balanced ration with alfalfa. Corn and alfalfa not only make a balanced ration, but the combination seems to keep the cow in exceptionally good order. It is generally thought that it is better to feed at least two kinds of concentrates, not that the ration will be balanced better but for the sake of variety. If corn is the only concentrate fed with the alfalfa it is well to mix some cut alfalfa with the corn for the cow does not do well on so heavy a feed as corn if fed alone. She is built for a bulky ration.

We should note that there is enough protein in this ration to produce 35 to 45 lbs. of milk but only enough carbohydrates for 25 lbs. It is not so objectionable to have an excessive amount of protein as it is to have too much carbohydrates. To illustrate this let us make a ration of timothy hay and corn chop.

	Dry matter.	Protein.	Carbohydrates.	Fat.
	Lbs.	Lbs.	Lbs.	Lbs.
18 lbs. timothy hay.....	15.6	.50	7.81	.25
8 lbs. corn chop.....	7.1	.63	5.34	.34
Totals.....	22.7	1.13	13.15	.59

In this ration there is enough protein to produce only 10 lbs. of milk or about one and one-half times less milk than the ration containing 18 lbs. of alfalfa hay. A yield of two tons of timothy hay per acre is considered very good,—at this rate an

acre will produce enough timothy hay, when fed with corn, to produce 2,200 lbs. of milk. It is not uncommon to grow four tons of alfalfa per acre and four tons of alfalfa when fed with corn, will produce 11,000 lbs. of milk. In other words, an acre of land, when sowed to timothy, will produce 2,200 lbs. of milk, and if sowed to alfalfa it will produce 11,000 lbs. of milk; that is, one half an acre of alfalfa and 888 lbs. of corn will produce 5,500 lbs. of milk and one acre of timothy and 888 lbs. of corn will produce 2,200 lbs. of milk. Does not this illustration show that it is more profitable to raise alfalfa than timothy hay? There is another point which we have not considered, and it is this; that the timothy hay and corn make a very poor combination not only for making milk, but for keeping the animal in good physical condition.

Feeding the dairy cow for profit involves the study of each animal in the herd; it requires that a man should know the amount of milk and fat that each animal is capable of producing; the dairyman should grow alfalfa and clover hay, instead of timothy, to feed with corn silage and home grown grain; a farmer should understand the relative composition of feeds so that an intelligent combination can be made; the relative market prices should be ascertained in order to know whether it is advisable to exchange home grown grain for mill feed, and it is well to understand the relative prices of feeds and dairy products that we may know whether to feed concentrates liberally or sparingly. High priced feed and low prices for milk or its products is an undesirable combination, but it is sometimes economy to submit to a present loss if probably profit in the future will more than counterbalance it. Bear in mind also that the food of maintenance must be supplied and only that which is fed in excess of this should be considered when the market runs the wrong way.

DISCUSSION.

President Hill: Mr. Glover was for many years closely identified with the field work of the Illinois Experiment Station, and kept a close tab on the workings of that station. Previous to that he was in Minnesota many years, so that he comes to us thoroughly well posted. Now, let us have a good discussion.

A Member: Is your ration a maintenance ration?

Mr. Glover: We first must have a maintenance ration. A balanced ration does not work the same with all kinds of cows. This is a maintenance ration and work ration combined. Certain kinds of food have sufficient nutriment in them, but it is locked up in such a way that no animal can get it out of the food. We must always consider the digestibility of feed. Corn chop means the ground corn including the bran. Corn meal is another term. We do not feed bolted corn meal to cows. It is better ground coarse for the cow. Now, the cost of that corn chop is about three quarters of a cent a pound; bran is about the same. That is six cents, and clover hay we value at about \$6.00 a ton; that makes about two cents for the clover hay; silage at \$2.50 a ton, makes about five cents for the silage; about thirteen cents I think that ration could be made for, and when fed to dairy cows, should produce twenty-five pounds of standard milk.

Mr. Goodrich: And milk averaged for the year a little less than a dollar a hundred at the creamery and the farmers had their skim milk back.

Mr. Taylor: That twenty-five pounds of milk is worth thirty cents.

Mr. Glover: No, the market price of butter last week was 27 cents.

Mr. Goodrich: Many creamery men are buying butter fat in the creamery and paying the full price for butter.

Ex-Gov. Hoard: But it is not worth thirty cents to the farmer, we want the net returns to the farmer.

Mr. Glover: Let us say twenty-seven cents. Then the man has made fourteen cents on thirteen cents worth of feed; that is he has marketed thirteen cents' worth of his farm products to a dairy animal which has returned him twenty-seven cents. You

are all looking for good markets; I wonder if you are all considering the markets you have in your own barns, whether they are good or not? Sometimes they are the kind of a market that we should not take our feed to.

I want to speak of an experience that I had in Illinois where I went from farm to farm and tested dairy herds. On one of my trips I went to a certain man's place and he says, "Our baby is not doing well, we don't know what the trouble is; we give it our own herd's milk." I said, "I believe I know what is the trouble." I want to say, first, that I did not advise those men that I saw on their farms, to feed any different way than their natural way the first year. I wanted to see what they would do, and then I wanted to start them feeding for a profit in the second year. I said to this man, "Mr. Smith, you are not feeding your cows right to keep them in a healthy condition. Let us see what your ration is." So we looked into the kind of ration that was being fed and we found the cows were getting more carbohydrates than they could handle and keep in healthy condition and not nearly enough protein in order to produce normal milk. The result was that the cows were in very poor health and the man was losing money on them. I said "You better give your baby some condensed milk." He tried that and the baby came out all right, it thrived. I could tell you many instances like that, I could also show you how the next year, when we changed the feeding and fed a balanced ration, how the same cows produced sixty pounds more butter fat per cow than they did in the first year, and they were healthy, they looked well. His ration costs him less because he sold some of his feed and bought other feed that was better adapted to combine with his feed than those he had grown on his farm.

Prof. Emery: Will a cow eat eighteen pounds of alfalfa a day?

Mr. Glover: Oh, yes, they will eat twenty. I have been a little conservative, because timothy hay as a rule is worth more on the market than alfalfa hay.

Mr. Rietbrock: You mean it brings more money?

Mr. Glover: Yes, perhaps I misspoke myself. We are dealing with problems all over the United States, and it is true that in some localities timothy hay will really sell for more in the market than alfalfa. It does not in Wisconsin, though it sells

for more than clover hay even here. Therefore I hardly know what value to put on the alfalfa hay on the farm.

Ex-Gov. Hoard: Take it at the price it has been selling in Fort Atkinson, \$12 a ton.

Mr. Glover: That means that the hay would cost about ten cents, and the corn would cost about six, and that would make sixteen cents. Of course it doesn't cost you that much to grow it.

Prof. Emery: Then shall we remove our silos and raise alfalfa?

Mr. Glover: No, you need them both; alfalfa and silage make a splendid combination, thirty to thirty-five pounds of silage and from five to ten pounds of alfalfa.

Ex-Gov. Hoard: You have not used silage in your illustration.

Mr. Glover: No, what I want to compare here is the value of timothy hay with alfalfa, the relative amount of milk that can be made from them. That is what you are looking for. You grow an acre of timothy hay, and feed a certain amount of corn and you get twenty-two hundred pounds of milk, while half an acre of alfalfa and the same amount of corn will give you fifty-five hundred pounds of milk.

Mr. Taylor: But in order to produce that amount of milk you have to have a certain class of cows.

Mr. Glover: Yes, we must have dairy cows, bred for dairy purposes, and kept under certain conditions, and all that belongs to the problem of right dairying.

A Member: Will you get it in the shape of fat if you don't get it in the shape of milk?

Mr. Glover: That would not be a dairy cow. A dairy cow that is milking and properly fed, does not put fat on her body.

The Chairman: While the most important part of this subject is this alfalfa phase, at the same time we have invited Mr. Coburn here to talk alfalfa to us so that we do not want to exhaust this subject now.

Prof. Emery: In that second chart, you have forty pounds of silage and four pounds of corn chop. There was a something said in connection with Mr. Taylor's remarks yesterday about getting along with four pounds of corn chops and four pounds of bran.

Mr. Glover: I don't think we just understood one another fully yesterday, and I would like to put that a little differently. We must remember that Professor Haecker plants his corn close together so that it comes up very thick and does not make a stalk much larger than my finger. It may develop a small nubbin, but not an ear. Now, then, the nutriment in that is distributed in the stalk and the leaves. The stalk has not thrown all the nutriment into an ear and there is not a large amount of crude fiber developed. If you plant your corn so that it will develop ears, after a certain time the nutriment goes over into the ear and the stalk begins to harden.

Ex-Gov. Hoard: Then you have one more proposition, that is the larger production per acre.

Mr. Glover: You can grow more of that kind of corn per acre and the cow that gets forty pounds of that corn, grown where the ear was not allowed to develop, will give you just as much milk. The chemist takes it into the laboratory and analyzes it and he says that silage has just as much nutriment to the hundred pounds as silage that had the ears on it; but it is in the stalk. What difference does it make so long as you are feeding a definite amount of nutriment?

Prof. Emery: Relatively, how much more corn to the acre is produced in that manner than as ordinarily planted?

Mr. Glover: I should say over twenty per cent more.

Prof. Emery: And does not Professor Haecker also claim that it has a larger proportion of protein?

Mr. Glover: Yes, but you know Wisconsin silage has a little larger per cent of protein than corn grown south of us, so perhaps it is not due so much to the method of planting as to the climatic conditions. Here silage averages 1.2 pounds of digestible protein, while farther south it is only .9 of a pound.

Mr. Goodrich: Professor Haecker has, by his experiments, upset some of our ideas that we got some years ago, but I know that long before we made any silage I and other dairymen used to plant some corn for fodder corn, we would put in a bushel and a half or two bushels to the acre and I fancy that is something like Professor Haecker plants it, and it grew up fine stalks and no ears to amount to anything. The stalks were soft and the cows used to eat them up clean, but the agricultural professors and teachers in those days told us that had very lit-

tle nutriment in it. They said that corn needs lots of sunshine to make the nutriment in it and when it was planted so very thick there was very little nutriment in it compared with corn that was planted a little thinner so that the sun could shine in it. Well, of course, I was going to follow these teachers, so I planted corn about eight quarts to the acre and I got as many tons to the acre as I did when I planted it thicker, especially in the dry seasons, and I thought it was better, because it had almost as much corn, if not fully as much as it would have had if it was planted four quarts to the acre and every stalk had an ear on, a small ear. Now, I am not taking issue with any of the speakers or with Professor Haecker, and I am trying to learn yet all I can about it, but I think this is quite an important question, and we would like light on it. One question is, does it here in Southern Wisconsin, or in latitudes farther south than this, have as much nutriment in it when it is planted so thick that the sun cannot shine in it and it does not have any ears on it? That is a question that we want settled.

It may be different way up in the northern part of Minnesota where the sun shines eighteen or twenty hours a day in the summer time, and it shines brightly, and they don't have any clouds. But this theory may be all wrong for us.

Ex-Gov. Hoard: Sunshine puts in the carbohydrates. It does not put in the proteins, it doesn't put in the nitrogen. It puts in the sugar, the carbohydrates and starchy matter.

Mr. Glover: I think Mr. Goodrich made a good point. It may not be good practice for this country.

Mr. Everett: You are not prepared to advise the farmers of Southern Wisconsin to raise corn without an ear?

Mr. Glover: No, I am not.

Prof. Emery: According to your chart it is apparent that it would not be wise for us all to drop silage and raise alfalfa and feed that with the corn?

Mr. Glover: We have a balanced ration here. The feeding problem is too big to cover all at once. You take cottonseed meal and corn and timothy hay and you can get a balanced ration, but the combination is not good. In the first place, you have a very concentrated food in cottonseed meal and corn and we know that the cow wants a bulky food. Moreover it is dry; it is not succulent, and we all know that the cow needs a certain

amount of succulent food, and that you get in your silage. The alfalfa comes along and supplies you with the protein that corn silage lacks. It also lacks another element that tends to keep the cow's bowels in good condition. There are no hard and fast rules to follow in making up these ration formulas, but they are good guides for the intelligent feeder. To start with, the cow needs succulent food; she needs bulky food; and then she needs grain food, according to the amount of milk flow. I do not believe that there are very many dairy bred cows in the United States, weighing a thousand pounds, that are capable of handling economically over ten pounds of grain per day for any length of time, and keeping in good physical condition and raising good strong calves.

Secy. Burchard: Why silage? This in a way would seem to indicate your preference for feeding cows forty pounds of silage, a little clover hay, some corn chop, but why silage for Wisconsin?

Ex-Gov. Hoard: It is an economic question.

Mr. Glover: It is the cheapest feed you can raise for a cow and she needs succulent feed.

Prof. Emery: Was it true that some of the feeders at St. Louis found they could lessen very much the quantity of silage and substitute alfalfa?

Mr. Glover: We are looking, not for a brief, phenomenal flow, but for the most profitable flow for a year; and not for this year alone, but for this year and for the coming years besides. For instance, in the Elgin district, some men have adopted a system of feeding fifteen to twenty pounds of grain per day, crowding their cows, but their cows do not stand that but four or five years. The true dairymen cannot afford to feed cattle like that. Moreover, do not understand that I believe in scanty feeding. I believe in liberal feeding, but make the bulk of your feed roughage, alfalfa, corn silage. You can grow those things here, and that is the reason I made this ration for Waukesha county. You can all have silos, you can all have clover or alfalfa hay. I could put down a ration of clover hay that would look just as well to you and it would be a balanced ration, but the cow would not keep up her maximum flow.

Mr. Goodrich: We have to put in some grain with the alfalfa.

Mr. Glover: Yes, and I would chop the alfalfa and mix the grain with it.

Mr. Goodrich: What is the matter with corn meal?

Mr. Glover: All right, you can have that, but I never would feed a cow corn chop alone.

Prof. Emery: But what are we novices to do? Brother Goodrich tells us he wants corn. Brother Taylor says to take no account of the corn.

Mr. Goodrich: No, he says a ton of corn doesn't make any more difference than a ton of silage, good silage.

Mr. Glover: This fodder corn has not taken the nutriment out of the stalk and made an ear out of it, but it has that nutriment in it. The stalk of corn that Professor Haecker talks about has the nutriment in the stalk and it has not made an ear. The stalk that Mr. Taylor was talking about yesterday had produced an ear of corn.

Ex-Gov. Hoard: The stalk stops growing and the ear develops from the stalk after a certain point.

Mr. Glover: Yes, and when we put corn in the silo with developed ears on it, we want to take it just as it stops taking the nutriment from the soil.

Ex-Gov. Hoard: I would like you to illustrate one thing more, and that is the combination of corn and ensilage and alfalfa hay making an almost perfect ration.

Mr. Glover: Corn goes well with alfalfa.

That is another thing in studying feeding, we must learn the combinations of feeds that seem to be best adapted to the cow.

Prof. Emery: You don't clear up my trouble. Here is Brother Taylor, a very eminent feeder, and he says take no account of the corn when you are feeding silage, while Brother Goodrich says, reckon with the corn and that seems to be in conflict.

Ex-Gov. Hoard: They have always been fighting one another, but I want to say one word right here. In my own experience, in my barn, I find that ten to twelve pounds of alfalfa hay a day and thirty-five pounds of corn ensilage with corn in it that runs seventy-five baskets to the acre, makes an almost perfect ration and it enabled me to reduce the cost of my grain ration fifty per cent. If I was feeding eight pounds for my grain ration a day, say, five pounds of bran and three pounds

of ground barley, I can get from my cows on the average about as much milk cutting that grain ration right in two and feeding corn silage and alfalfa. I could not do that without the silage; I couldn't do it with timothy hay. There is the economy of the silo; in this way I am enabled to make a cheap ration by adding that silage, a very cheap ration. And they do not ask me how much my milk costs, down in the St. Louis market or the Chicago market; that is my business at this end of it, the farm end, to reduce the cost of making the milk. I can't affect the market over there, not a minute, not a penny, but I can affect it at the farm end as to the amount of money that the milk is going to cost me, and there is where my head must come in, there is where my mind must do its work and that is where nine-tenths of the farmers pay no attention whatever.

They are looking over at the creamery all the while and asking, "How much are we going to get for our milk?" All the time looking over there and never paying any attention as to how much the milk is going to cost to produce. I tell you the farmer is not the master of any other spot or place, except his own farm, and the farm end of this proposition is the big end, and it has the least amount of brain devoted to it.

Mr. Glover: I want to say one thing further in regard to that herd. Last year that herd received from five to eight pounds of grain daily and they averaged, young and old, everything in the herd, 321 pounds of fat, equivalent to 375 pounds of butter, practically 7,000 pounds of milk. That is the Governor's herd.

Mr. Everett: Hoard's proposition is the best one that has been presented in this convention.

Mr. Glover: A half an acre produces two tons of alfalfa. You see by these figures that this one-half acre of alfalfa will produce twice as much milk as one acre of timothy hay—with same grain feed, of course.

Mr. Thompson: And you take the fertilizing value to the land and there is another additional element.

A Member: Have you any comparison of alfalfa with silage in the same way?

Mr. Glover: It is pretty hard to compare these things because they are quite different; we must have our alfalfa to feed with our silage. Some men will say that bran is worth

twice as much to feed to the dairy cow as corn chop. It isn't so always; corn chop may be worth twice as much as bran under certain conditions. It depends on what your other feed is. A man has got to study these things out.

A Member: You would not need as much corn meal if you had corn silage.

Mr. Glover: Not nearly so much, but at the same time you can feed corn chop always in connection with alfalfa. Corn in any form makes a good combination with alfalfa.

Mr. Taylor: My friend, Emery, over here, is uneasy. He thinks he has got Goodrich and me at loggerheads with each other. Evidently he was whispering yesterday while I was speaking and did not get the force of my remarks. I said that forty pounds of corn silage that grew an ear on every stalk, which was planted four stalks in the hill, five feet in the rows, north and south, where the sun shone on the stalk and on the ground and developed the sugar in the lower joints of the stalk very largely, that was the kind of silage that I liked to feed to my dairy cows, forty pounds a day, and in such corn silage there is on an average about four pounds of corn and that four pounds of corn is what bothers Brother Emery, but it does not bother the cow at all.

Prof. Emery: I understood you to say that you take no reckoning of that four pounds of corn; that you feed just as much corn as if there was none in the silage.

Mr. Taylor: For that cow, that she may do her best work in the dairy, please make no reckoning of that amount of corn in that day's ration. If you get to figuring on that four pounds you will be withholding some more feed from her and she needs the rest of her feed and can take care of that four pounds, because her digestive capacity is greater with that succulent feed. I did not intend to say, and I do not intend to say today, that there is no value in the four pounds of corn found in the ensilage, but please call it "pie" or "cake" or "dessert," "extra," whatever you want to call it, don't make any reckoning of it.

Ex-Gov. Hoard: Don't feed any less of anything on account of it.

Mr. Taylor: No; that is the idea. Don't reckon out something else because you are feeding that corn in the ensilage.

There is another question I want to bring up. We have got

onto two lines of computation; we are computing from the value of the corn stalk with an ear on it and have made that a unit of computation in making up the ration of the cow; with the Haecker kind of corn grown up in Minnesota, there he made the acre of ground the unit of computation, and so there was inconsistency in our standpoints. If you take an acre of ground and make that the unit of computation in growing feed for a cow, possibly you can raise more food elements on an acre of corn planted thick than planted thin and it may be a reasonably well balanced ration. Did you ever think that oat straw was a pretty well balanced ration?

Ex-Gov. Hoard: It is for paper making.

Mr. Taylor: It is for the cow eating it. The chemical analysis shows it.

Secy. Burchard: Oh, no.

Mr. Taylor: Pretty near it. But how much of it would you have to eat to get enough, if you were a cow?

Mr. Goodrich: It is one to twenty-six.

Mr. Taylor: Then I am way off. I just ask you to forgive me for mentioning that part of it.

Mr. Goodrich: Don't make another such a mistake.

Mr. Taylor: No, I won't.

A Member: Corn at the stage you put it into the silo, the glazing stage, is an excellent feed for an animal and especially excellent for the cow, and she will thrive on it and do well for a time, week after week. If you feed that same feed put into the silo, week after week and month after month and not give them anything else, you have got animals that are ready for the bone yard. Doesn't that prove the fact that the food has lost a large part of its value and you are not taking out what you put in?

Mr. Taylor: No. It proves that it is not a balanced ration.

Ex-Gov. Hoard: With forty pounds of silage, you are feeding thirty pounds of water. With your dry fodder, if you feed sufficient to equal the forty pounds of ensilage you have only got ten pounds.

The Member: But if they will do well on that.

Ex-Gov. Hoard: They won't. If you continue it long enough with either one, she will not live on silage alone any more than she will on corn fodder alone.

PROFITABLE MILK FROM THE PRODUCERS' STAND-
POINT.

Charles Linse, La Crosse.

The Chairman: Mr. Linse owns two farms in La Crosse county and keeps fifty excellent cows on each. On one farm a large part of the milk is made into butter and on his home farm the milk is delivered to a high class trade in the city of La Crosse.

Mr. Linse: Mr. Chairman, Ladies and Gentlemen: When I received an invitation to come to this convention and address you on dairy topics, I was saying to myself, now, what in the world can you tell these dairymen of the state of Wisconsin but what they already know—may be much better than yourself, and I strained my brains very much for days to think of something new, something great, something that might interest you, but I couldn't think of any thing but the old story that has been talked over and over, and so if I fail to interest you, I hope you will return good for evil and let me hear from you and learn something from you. That is what I am after always, and now I give you what I have got.

Market milk from the producer's standpoint is the topic before us. How to make the production of milk most profitable is what we are all trying to find out. But what course to follow in order to accomplish this, depends so much on personal and local conditions, that no one method can be given for all concerned in the matter. Nevertheless, there are certain general principles which must be observed if the production of milk is to be profitable at all.

To make the production of any article profitable three points must never be lost sight of, namely: cheapness of production, superior quality of the article produced, and, last but not least, a good market for it.

In our case, the dairyman or milk producer must aim to produce milk at as low a cost as possible. The first thing necessary for the accomplishment of this purpose is good cows. If he wants to produce milk profitably he must have dairy cows from

a dairy breed; while, on the other hand, no man who understands his business would undertake to produce first class beef from a dairy herd. Notwithstanding, that these facts are indisputable, they are not yet fully understood and realized by many farmers engaged chiefly in the production of milk.

But the best cow would be of very little use to her owner, if he failed to give her the proper food and care. This is also an undisputable fact, but how many owners of cows have really grasped this simple truth? How many of them realize that it takes a certain amount of food merely to sustain the animal's life, and that both this food and his time are a total loss, if he does not supply her with food over and above what is needed to maintain life, in order to produce milk. In a certain sense a cow is a machine which transforms food into milk. To make milk production profitable that machine must be worked to its full capacity. The owner of the steam engine may fire his engine, the year round, with just enough fuel to develop sufficient power to turn the empty wheels; so a man may feed his cow just enough to keep her alive, turning an empty wheel, so to speak. In either, fuel and feed would be a total loss. But to attain the best results it is necessary to feed not only the proper amount, we must also feed the proper kind of feed to our cows. So much has been said and written about the so-called balanced ration, that I will not enter into the question of feeding in detail, nor try to establish what proportion of the different food elements a ration for a cow should contain; but I will say—and I know it to be true by my own experience—that a succulent food, fed during the winter season is a great aid in the production of milk. In the earlier days, I used to grow turnips, mangel-roots, beets and carrots, and I fed them to my cows with the best results; but they require a great deal of labor to raise and to feed—enough to make them a comparatively expensive food. Today I think nothing more about raising these roots for such purposes, as for the past twenty-five years I have had, as a substitute for them, a succulent food in the shape of corn silage. And, by the way, I will and must say, that there is no other food produced on the farm, which cheapens the production of milk so much as corn silage.

In addition to good food a cow must have good care, if she is to do her best. Good, warm, comfortable quarters must be

provided for her. One thing that has always been a surprise to me is, that farmers who have warm, comfortable stables for their cows will turn them out in the cold for a good share of the day, where they stand in the yard or around an old strawstack, all crumpled up and in evident misery converting their food into carbon, to keep up their animal heat, instead of turning it into milk for their owner. What can be the object of such a practice? For I have found it not only among lazy, shiftless farmers, but among men who are really trying to do their best for their cows. They do it because they believe a cow must have exercise. Now this idea of exercise, according to my experience, is a mistake. I have found that my cows never do better than when they have the least exercise, when they are lying down, chewing their cud in comfort, and putting all their energy into making milk for me. This is to my notion, all the exercise a cow needs. You may say, "What about their health? A cow needs exercise for her health." I reply: For several years I have kept my cows in the barn all winter, without turning them out at all for about five months during the cold season; and at the spring opening, a healthier lot of cows could not be found in the state.

We have been aiming to get a large quantity of milk from our cows, but quantity alone will not do it, we must have quality as well as quantity, to make dairying a success. No first class article, be it butter or cheese, can be made from second class milk. Now the question might be asked: "What constitutes first class milk?" My answer is: The milk must first come from a healthy cow, kept in a clean, well ventilated stable, free from all foul odors; she must be fed with wholesome food, free from all mould and decay; the milking must be done in the cleanest possible way. The milk must be removed from the stable as fast as milking proceeds, and cooled, at once, to a temperature of 45, or at least 50 degrees Fahrenheit. While certain kinds of food sometimes influences the flavor of milk, yet in most cases when the milk is ill-flavored the cause lies not in the food the cow eats, but in the air she breathes. It is the foul stable odors passing through her lungs that taint the milk. A great deal has been said about the so-called cow or animal odor in milk. For years I have heard some of our best dairymen, and even professors, argue this animal odor question, and debate as to how to get rid

of this seemingly necessary evil. Airing, complete airing of the milk, was the remedy recommended. Now, I claim there is no such thing as an animal odor in milk, at least nothing that can be properly so-called. The milk of a cow that eats pure foods and breathes pure air is never better or more free from odors, than when in her udder. We know that certain kinds of food and plants, and also, as I have already said, foul stable odors, will give milk a bad flavor. But these odors you can not get rid of by all the airing you may give the milk.

Now a few more words as to how a man should market his milk so as to get the largest possible return. As I said in my opening sentences, a man must be governed to a great extent by his own circumstances and conditions; what may prove a most profitable method for one, may be an absolute impossibility for another. My own experience is limited to making butter and selling milk at retail, direct to the consumer. I have never sold a pound of milk to a factory. I have made butter on the farm for nearly 40 years, and for the past five years I have been engaged in selling bottled milk. A man can certainly realize more on his milk by making it into butter himself, than by selling it to the factory. Not because he saves the expense of making—for his labor is worth as much as the labor of the butter-maker in the factory—but because he can make an article superior to that of the factory, and can therefore demand a higher price for it. Now I hope that my friends, the buttermakers, will not declare me an outlaw for making such an assertion. They must admit that the farmer has full control over his cows and milk, and, therefore, does not have to depend upon some one else's skill and honesty; while the butter maker in the factory, in these particulars, is dependent upon a great number of persons, over whom he has little or no control. The farmer, therefore, has the advantage over the creamery in making the finest quality of butter. But in order to reach that high mark of perfection which will justify him in demanding a high price for his butter, a man must have an abundance of skill and patience and perseverance. The more easy way, and probably the better way, for the average farmer, is to sell his milk to the creamery.

As I have already stated, I am at present selling bottled milk to the consumer. If a man lives close to a city he can make this quite a profitable business; but that he will find that skill

and honesty are more essential to this, than to any other method of marketing milk. A man has to build up a reputation. He must be known as a strictly honest man; people must have confidence in him.

The successful dairyman must be progressive and a student of his business; he must attend dairy conventions, read dairy literature, bulletins, etc., and mingle with successful men engaged in the same kind of business. In short, he must avail himself of every opportunity to improve his mind in order that he may conduct his business intelligently and derive a profit. More than this he must do a little advertising. No business man, in our day, thinks for a moment of being able to make his business a success without advertising. And why should not we farmers make use of ordinary business methods in marketing our products? "Yes," you will say, "this advertising is a regular nuisance; in most cases it's a swindle, generally there is no truth in it." You may be right—in many cases it is a humbug. But at the same time many thousands of good, honest men advertise, and prove to people that they can rely on what they tell them. Now you want to be among these honest advertisers, and tell people that you are prepared to supply them with first class home made butter, or strictly pure milk; and if you prove what you tell them, success will be yours.

DISCUSSION.

The Chairman: I have noted in some of the remarks made here a little bit of antipathy to the silo question. Governor Hoard spoke yesterday of how many more silos there are in Jefferson county than in Waukesha county. Now, you have heard what Mr. Linse says about the silos, and I hope you will go for him as hard as you please, and I believe you will go away from here ceasing to be critical of silos. Now, go at him.

Prof. Emery: At what time do you feed silage, before or after milking, or do you pay no attention to that?

Mr. Linse: We do, we milk first, before we feed anything in the morning, and when we have done milking we feed a fodder

ration, which contains about—I haven't the accurate figures, but it is a bushel basket containing about two-thirds silage and one-third chopped corn stover to each cow. Some will eat more and some less. The corn silage we throw out in the evening on the feeding floor and mix it with the corn stover, it kind of softens it.

Ex-Gov. Hoard: One softens the other.

Mr. Linse: Yes, and the cows like it in that way, and I am trying to please the cow. We mix it at night and feed it the next morning. Then they get their ration of concentrated food. One man brings up the corn silage and stover, the coarse food, and puts it in the manger, and another man follows right up with the concentrated food and puts it right on the silage and they eat it altogether.

Prof. Emery: Do the cows clean up all this dry fodder?

Mr. Linse: They will first eat the parts that suit them best, as all cows will do and some men, and then they will go for the balance. This is a pretty good gauge, not to overfeed. They will pick out the best and if they have too much they will not clean it all up, they will leave a few nubbins perhaps and we will clean out the manger.

A Member: Did you ever feed any corn meal?

Mr. Linse: Yes, I used to, sometimes.

Ex-Gov. Hoard: What is your concentrated ration?

Mr. Linse: At present I am feeding wheat shorts and dry brewers' grains. We moisten them with hot water about six hours before. They will swell up and soften and then we take these grains and mix them right with the dry shorts and they make a very nice combination.

The Chairman: I remember once, Mr. Linse, that you fed the refuse from a mill, screenings. Was there any particular reason why you discontinued that, or was it because you could not get the screenings any more?

Mr. Linse: I fed those screenings in the early days, when I bought them very cheap. I used to buy them for three or four dollars a ton, I watched the elevators and when the time came that I could get a lot of them cheap, I used to buy fifty or a hundred tons and fatten cattle, stock. In those days I had my own grinding apparatus and steam outfit and I steamed all those ground screenings, not because I thought they were more

nutritious, but these screenings contained a lot of foul weeds. My neighbors got onto it and they went after them, too, but they didn't steam them and they got their farms all full of all sorts of stuff. I steamed mine and that killed those seeds. Now, screenings are so much looked for that I don't buy them any more. On the other hand, for milch cows I thought these seeds put an ill-flavor into the milk. Anyway I didn't feed any more.

Mr. Race: Are those brewers' grains with molasses or just common dried grain?

Mr. Linse: Just common dried grain.

Mr. Dewey: What breed of cows have you?

Mr. Linse: I have bred Jerseys for the last twenty-five years about. They are bred on the old farm where the butter is made. But I am now engaged in the milk business and I have about two-thirds Jerseys and one-third of other cows. A man engaged in the milk business finds it a pretty hard matter to keep an even flow from his own breeding, and he must have that. It is a pretty hard matter to get those cows to come in just as you want the milk, over the whole year. Another thing, I am hardly getting a big enough price so I can afford to sell all straight Jersey milk, so once in a while I have to mix in other kinds.

Mr. Dewey: How long have you used silos?

Mr. Linse: Twenty-five years, coming twenty-six. If I remember right, my silo was the third one built in the state. They had one on the Experiment Station farm and Professor Henry gave me at that time an introduction to a man, I think Dr. Weeks of Oconomowoc.

Mr. Philips: Mr. Linse is producing just as clean milk as Mr. Gurler, but he hasn't got quite the market that Mr. Gurler has.

Mr. Linse: I have been growing silage going on twenty-six years and we have learned a great deal about growing silage.

Prof. Emery: At the end of the twenty-five years, do you say that silage is the cheapest food the farmer can raise?

Mr. Linse: It produces the cheapest milk of anything you can grow on the farm.

Mr. Dewey: And is it your opinion that the food value of the silage is out of the silage itself, or do you get better returns out of your other food from feeding silage?

Mr. Linse: Well, I think that the silage itself is not only a

cheap food, but I think it is a very wholesome food. I think that the little acid in the silage is a sort of a digester—I have got that idea, I don't know whether I am right or not, but I believe it helps the digestion. I know my cows never have been healthier than they are while they get their silage. They like it and they do well on it, and are in bright, healthy, good condition.

A Member: How short do you cut your silage?

Mr. Linse: Not quite so short as some, about an inch and a half I think, and I see no necessity for cutting any shorter.

Mr. Goodrich: Do you aim to feed your cows a variety of food, or keep them right straight along on one kind of forage or one kind of grain for months at a time?

Mr. Linse: Well, they get a variety, but about the same variety pretty much during the winter season. It is a little mixed sometimes; they get silage, of course, every day, and in combination with the silage I have, for instance, some corn stover, they get that for a couple of weeks. Then I get some oats, cut it green, make hay out of it, but sometimes that gets to be kind of tough. I cut that on the feed machine and mix it with my silage and they will eat it up clean, so they get that in combination with the silage. Then sometimes I have clover hay. Unfortunately the last two winters our clover got killed by winter killing, so I had but little. This I cut up with a feed cutter and mix with the silage. They get one ration of hay of whatever kind I can buy or raise myself.

Ex-Gov. Hoard: You seem to be quite strongly inclined to making a chop of your feed, cutting up everything.

Mr. Linse: It is not because I think that it adds anything to it; on the other hand, I think a cow must have some bulky food that is coarse, it aids digestion, and they get one meal along at noon. I feed them just what they like to eat. When they have their morning's ration, chopped food and silage and concentrated food, notwithstanding, that we take the best care in watching those cows to see that each one gets what she wants, still sometimes a cow don't get quite satisfied and so this noon ration of hay comes along and they will get just what they want to eat. Some are a little more hungry and others a little less. So I do not chop up the food because I think it is of more value to them, not because it is more digestible, but because it is so

handy to feed, it is more easy to handle. We always feed hay once a day.

Mr. Race: Did you ever feed any alfalfa?

Mr. Linse: I am very sorry to say I have not, because I haven't got it. I don't think I can raise it on my farm.

Ex-Gov. Hoard: Have you tried it?

Mr. Linse: I have tried it, yes; and I am going to try it again. My boy is commencing to experiment on it I think in the valley. We have these slopes of good, rich clay soil, with limestone bottom, and I think it ought to be all right, providing it doesn't winter kill.

Ex-Gov. Hoard: I think you will find it will grow on that kind of land. I think where it has a good slope it will do better than down where it is on the flat land.

Mr. Linse: We shall try hard to raise it. I have tried a little on the place where I am now, but I think that soil is not very well adapted to it, at least it did not do well.

Ex-Gov. Hoard: I never have visited your farm, you know, though you have visited mine, but I thought from what you said that you put a very high value upon the question of whether your cows get a constant supply of pure air. How do you ventilate your stables?

Mr. Linse: I ventilate on the King system.

Ex-Gov. Hoard: Do you notice any difference in your judgment and observation in the thrift and tone and condition of those cattle since you introduced that ventilation system, from what obtained before?

Mr. Linse: I did not have exactly the present system that I have in my new barn, still the old barn was well ventilated, for the past thirty years, as long as I have been engaged in the business. My stable was pretty clear from foul odors always.

Ex-Gov. Hoard: For how long did I understand you to state in your paper that you have kept your cows in the stable, was it four or five months in the winter?

Mr. Linse: And I do it still.

Mr. Goodrich: How many years have you practiced that?

Mr. Linse: This is the third year. Even on the old farm I did keep my cows in for weeks at a time, in severe, cold, stormy weather, and then turned them out, but I found that the change, after they were kept in the barn for a week or ten days and then

turned out again for a few days, did not seem to work well. It is much better to get the cows accustomed to staying in, if you keep them in at all, or if you turn them out at all, turn them out a little every day if it is only half an hour.

Mr. Goodrich: Do you water in the barn?

Mr. Linse: Yes.

A Member: How do you tie them in the barn?

Mr. Linse: I use the so-called Bidwell stalls.

Ex-Gov. Hoard: Where you keep cows in the barn in that way, there must be sufficient warmth so that they give a good flow of milk.

Mr. Linse: Oh, certainly.

Ex. Gov. Hoard: Now, then, under those circumstances it becomes imperatively necessary, doesn't it, that these cows have pure air; otherwise, there is where tuberculosis is going to get in its work, from a lack of ventilation and the cows confined.

Mr. Linse: Now, on this question of pure air, even if you turn out the cows part of the time during the day, if they breathe foul air in that stable for one-half the time it is just as bad, I don't know but it is worse if they are turned into the cold after breathing that warm, foul air twelve hours?

Ex-Gov. Hoard: We are coming rapidly to understand that we have got to furnish pure air to our cows.

Mr. Taylor: Not very rapidly.

Ex-Gov. Hoard: Tuberculosis is making men understand it. They have killed three herds in my township in the past six months, and every one of them poisoned to death by the deliberate stupidity of the owner, and you couldn't make either of those men listen a minute to any instruction or any thought. But the mills of the gods grind slowly, though they do grind fine, and those three men lost herds varying from eighteen to thirty-one cows. Now, they are willing to say, "Men and brethren, what shall we do?"

A Member: Don't you think that the feed had something to do with that? Don't you think that these people were feeding some of this rotten, ground food?

Ex-Gov. Hoard: No, tuberculosis is not a food disease; it is a germ disease; the same as smallpox. Smallpox doesn't come from what you eat, it comes from a germ.

A Member: Do not the condensers object to the by-products which you say you feed?

Mr. Linse: I can't see why this by-product, if it is in proper condition, is in any way injurious at all. My customers would object very much to my feeding wet brewers' grains because they will produce a fermentation very rapidly.

Secy. Burchard: And because they foul the manger.

Mr. Linse: Yes; while the dried brewers' grains come direct from the malt kettle, they go through the press and are dried in ten or fifteen minutes, or perhaps they are run over some kind of a machine that dries them. At any rate they make one of the best feeds we know of; my cows have never done better than since I fed dried grains.

A Member: Did you ever feed malt sprouts?

Mr. Linse: I fed a few, years ago. I think they are a good thing, but I can't buy them in La Crosse. Our wise lawmakers have made a law, as I understand, that every dealer in these by-products, brewers and mills, have to pay a license, and we have only one large brewery in La Crosse which handles these grains, at the same time the brewers there sell them in wet state, they have ten times as much of these malt sprouts, and they are excellent feed, they are the highest protein of any by-product, except gluten feed, but they tell me they can sell all their malt sprouts, but they won't pay the license.

A Member: Can you give the dairymen a list of what ought to be fed and ought not to be fed to dairy cows in the shape of these by-products?

Mr. Linse: Well, I don't know of any by-product that would be injurious to a cow.

A Member: Have you fed any of these distillery slops?

Mr. Linse: No, I never fed any, and I suppose I would not feed them, but all other things—by-products—bran and shorts and other foods, oil meal certainly is a splendid food. Gluten feed I never fed. I don't see any objection to feeding any of those things.

A Member: Then you emphasize the fact that it is more the way a man feeds it than the food itself?

Mr. Linse: Well, all those foods can be overdone and if you feed to excess, you will injure your cows' digestive organs and

if a cow does not digest well, she will produce ill-flavored milk and unhealthy milk.

Ex-Gov. Hoard: Have you ever tried ground barley?

Mr. Linse: I have not. My son has this winter, and he says his cows are doing very well. He doesn't feed it alone, he mixes it with bran.

Ex-Gov. Hoard: It is one of the best combinations I have ever got a hold of; say, you are giving a five-pound ration, three pounds bran and two pounds barley meal with your alfalfa.

Mr. Linse: I haven't alfalfa, I would have to double that.

Secy. Burchard: I simply want to say in reply to certain questions here about the dried grains, that at a recent convention of the New York dairymen, Dr. Jordan of the New York Experiment Station, treated this subject, not only from the point of a scientist, but from actual feeding, and he says, there is no better feed, whether for the health of the cow or the healthfulness of the milk, than dried brewers' grains, and dried distillers' grains, too. Now, there is a well founded objection against distillery slop and there is a well founded objection against wet brewers' grains, not because it is inherent in the grains or the slop when the cow gets it, but because they are almost invariably sure to befoul the mangers and the barn, to make places around in the cracks where bacteria will grow and multiply, to become rotten, and, of course, to give off more or less offensive odors which will have a tendency to taint the milk more or less as they go into the cow's nostrils and through the nostrils into the lungs and into the blood and into the milk.

Mr. Race: I would like to ask will it pay the common run of farmers, will they think it good business, to sell barley at fifty cents a bushel, a cent a pound, and pay five dollars a ton for wet grains when it takes about four tons of wet grains to make one of dry feed?

Mr. Goodrich: That would be the same as \$20 a ton for the dried grain.

Secy. Burchard: And \$20 a ton for the barley.

Mr. Race: What is the process of producing these wet grains?

Secy. Burchard: They withdraw a portion of the carbohydrates from the barley, so that a pound of brewers' grains contains a much larger proportion of protein than does the bar-

ley, just the same as bran contains a larger per cent of protein than wheat from which it is made, because in milling the wheat, they have taken out the starchy portion but have left a large part of the protein, that was in the wheat kernel, with the bran, so that you get a larger proportion of protein in your malt sprouts or your dried grains, than you do in the original barley.

Mr. Race: But if you balance that barley with other food?

Secy. Burchard: I had occasion just the other day to answer that question. The question came in, whether a man could feed wet brewers' grains in place of corn meal to balance up a ration, and I was first disposed to answer no, of course; but on reflection, I did not know why we could not do that. Of course the wet brewers' grains would increase the amount of protein in the ration and make it much more than was really necessary for the cow, but the scientists tell us that the cow can use the protein for exactly the same purposes that she uses the carbohydrates; that is, its fuel value is practically the same, and after she has used sufficient protein to make her milk and her muscles, she would turn the surplus over toward making heat, and I came to the conclusion that five pounds of the wet grains were practically equivalent, in feeding value for all purposes, to one pound of corn, and corn and barley are quite similar, you know. So I think that if a farmer should sell his barley for fifty cents a bushel or twenty dollars a ton, and buy the wet grains at five dollars, he is making about an even trade; providing now, when he uses his wet grains, that he gets them fresh and that he feeds them fresh and that he is very careful about the receptacles in which he feeds them and does not let a lot gather round in the corners, etc. If he had an old fashioned butter bowl to feed out of, it would be a very nice thing; or if he would make a modern cement manger, rounding all the corners so there will be no good place for an accumulation in corners, just as Mr. Searles said about the milk pail. You don't want a pail or any other milk vessel to have these ordinary seams, but you want them flushed up full, solid, so there shall be no little cracks for particles of milk to accumulate in. It is just the same way with your mangers, you must avoid cracks and corners. The modern cement manger is an excellent thing and the cow washes it out

very cleanly every time, if you do not overfeed her, with that excellent cleaner, her tongue.

Mr. Walter Jones: It seems to me there is another product that might be used profitably, and that is beet pulp. How is that for a feed?

Mr. Linse: I don't know anything about it, I never fed it.

Mr. Jones: We have a beet sugar factory in this country and they deal largely in by-products.

The Chairman: Dry or wet?

Mr. Jones: They call it molasses beet pulp now. It is dry with molasses added to it.

The Chairman: Molasses feed and beet pulp are two different things.

Mr. Jones: They mix the molasses with the dried beet pulp. I have had it in my barn.

A Member: Is there such a thing as dried beet pulp? Isn't it the refuse from molasses that they are talking about?

Mr. Race: I have bought molasses grains and there's brewers' grains and beet pulp and you have another one, malt sprouts, mixed together. I have bought this stuff when I couldn't really tell what there wasn't in it, there were mill sweepings and everything else in it. I am not condemning those grains by any means. A man sent me two hundred pounds to try them, but if you don't have a warm place to keep them—well, I had to take an axe to chop the bag open in the winter time.

Mr. Weidener: It seems to me that a part of Mr. Linse's explanation was given here yesterday. I have no doubt in my mind that he is a profitable cow man and I think one of his greatest profits is the long pieces of corn put in the silo.

Mr. Wells: Have you ever fed corn meal as part of the ration with ensilage?

Mr. Linse: I never have, as long as I am feeding ensilage.

The report of the secretary was read and adopted.

SECRETARY'S REPORT.

To the President and Members of the Wisconsin Dairymen's Association:

I have the honor to submit the following report, covering the period from the adjournment of our convention in Wausau last February to the present time.

It is known to all of you that I preferred a very urgent request in my last report to be relieved from further service as secretary, and that the matter of selecting a successor was referred to the Executive Board. At a meeting of that Board, held at Madison early in May, after mature consideration, it appeared to the members that the time had not arrived when a change in the office of Secretary was expedient, and, not without considerable reluctance, I deferred to their opinion, with the understanding that the President of the Association was to relieve me of much of the responsibility theretofore resting upon the Secretary. It is but justice to President Hill to say that he has most faithfully carried out his part of the program, but I am more than ever conscious of the importance of entrusting the duties of Secretary to some one who can give them more time and thought than it has been practicable for me to devote to such matters in recent years. I am profoundly grateful to the Association for the honors bestowed upon me, and the confidence and courtesy of which I have been the recipient for so many years, but the time has arrived when consideration for the individual should give place to the welfare and increasing usefulness of the Association. As contributory to that end I place my unconditional resignation in your hands.

During the past year I have drawn orders on the Treasurer to the amount of \$3,245.79 for the current expenses of the Association. The names of the persons in whose favor these orders were drawn will be stated in detail by the Treasurer, and it will therefore suffice to report here in summary the purposes for which the expenditures were made, as follows:

Convention expenses at Wausau.....	\$467.75	
Convention premiums.....	195.69	
		<hr/>
		\$ 663.44
Chesse Instructor, (Aderhold).....	\$619.50	
Creamery Instructor, (Corneliuson).....	558.50	
Cheese & Creamery Instructor, (Searles) ..	519.50	1697.50
		<hr/>
Miscellaneous expenses		33.62
Swiss Cheese Instructor, (Marty).....	\$315.00	
Swiss Cheese Instructor, (Zumkehr).....	420.00	
Printing Report.....	87.98	
Miscellaneous	28.25	
		<hr/>
Total for Swiss Cheese purposes.....		851.23
		<hr/>
		\$3,245.79

There remains to be paid, for services and expenses properly chargeable to the past year:

Secretary's salary	\$250.00
Office expenses	12.98
Postage, including mailing of last year's reports which have not been received, (estimated)	60.00
Printing and Stationery.....	22.00
President's travelling expenses.....	50.00
Salary and expenses of Instructor for January, (estimated)	150.00
	<hr/>
	\$544.96

It will thus appear that the current expenses for the year fall a little short of our annual appropriation from the state, which is \$4,000,—but not more than prudence dictates as a reserve for unforeseen emergencies.

There is now in the hands of our Treasurer, if there are no errors in my bookkeeping.....	\$1,083.96
And the available balance with the State Treasurer is	3,841.73
	<hr/>
Making a total of	\$4,925.69
We expect to receive for memberships this year.....	200.00

This furnishes a fund of say \$5,100 with which to meet the expenses of this convention, (which with premiums may reach \$800), pay the accumulated expenses of last year and to carry on some kind of field work during the coming year.

Since the change in the law so materially increasing the staff of the Dairy and Food Commissioner, there is less necessity, in my judgment, for this association to continue instructional work along the lines followed in the past. It would be better, in my opinion, to discontinue visiting cheese factories and creameries, and take up a line of work more directly connected with the milk producer, such as the organization and superintendence of test associations, modeled perhaps after the control societies of Denmark.

In making up his recommendations to the Governor for the appointment of Instructors under the new law, Commissioner Emery, anxious to secure good men, requested me to release Messrs. Aderhold, Marty and Corneliuson from their engagements with this Association that they might accept appointment under him. Believing it would be conducive to the general good of the dairy interests of the state that these men, who had proven their efficiency and had gathered valuable experience concerning the duties of inspectors and instructors while in our service, be transferred to the staff of the Commissioner, his request was acceded to, and they received appointments. It is believed that the Dairy and Food Commission as now constituted is doing excellent service under the new law. It is too early yet to expect very much in the way of visible results, as most of the work hitherto has been preliminary, but with the head of that Commission an ex-president of this Association, and his first and second assistants and three of his inspectors formerly employed by it, we may, and not without good reason, expect to see Wisconsin regain its supremacy as the banner dairy state of the Union.

Respectfully submitted,

GEO. W. BURCHARD,
Secretary.

The Chairman: I will now name the members of the following committees:

Nominations: W. D. Hoard, J. Q. Emery and C. H. Everett.

Resolutions: C. P. Goodrich, Fred Rietbrock and E. L. Aderhold.

Finances: H. C. Taylor, A. J. Glover, Charles Linse.

Exhibits: H. C. Searles, O. P. Clinton and D. O. Thompson.

Adjourned till 2 P. M.

Convention met at 2 P. M.

President Hill in the chair.

TUBERCULOSIS AS IT RELATES TO THE DAIRY FARMER.

Dr. H. L. Russell, Madison.

Mr. President, Members of the Convention: The subject that has been announced is tuberculosis as it affects dairy cattle.

In a question of this kind the first thing we can consider is whether the gravity of the disease warrants a full consideration such as is outlined for this afternoon. You have given a prominent place on your program to this matter and in bringing it before you I think we can perhaps profitably turn our attention, first, to the amount of tuberculosis which we have in this state. First, are we in possession of facts which enable us to know what proportion of our cattle are affected with tuberculosis? Is that proportion greater among dairy cattle than among beef cattle? Is this disease on the increase or the decrease in a general way, and altogether what is the gravity of the proposition?

We have been working upon this problem of tuberculosis in the state of Wisconsin about twelve years. The Experiment Station was the first to introduce the tuberculin test as a means of diagnosing the presence of this disease in cattle. This was done in 1893 and I might say that these tests were the second.

so far as I know, to be made in the United States. They were made very soon after the introduction of the tuberculin treatment with human beings.

In the earlier years of this agitation, progress, with reference to the accumulation of data as to how prevalent tuberculosis was, was exceedingly slow. In those early days it was a question as to the accuracy of the tuberculin test as to its integrity, whether the results which were obtained by the aid of the tuberculin test could be relied upon and we had in addition to this a great deal of apathy and indifference to overcome on the part of the farming public. They were rather reticent in taking up what might well be termed at that particular time a new fad, and not only that, but there was actual opposition on the part of a good many people in regard to the application of the test. So that in the early days of this agitation, the accumulation of data was relatively slow.

The work against tuberculosis, however, in this state has been carried on, not only by the Experiment Station, but also by the State Live Stock Sanitary Board and through these channels there has been accumulated a considerable body of evidence. The data which has been collected by the State Veterinarian and the Live Stock Sanitary Board has been from herds in which cattle were known to be tuberculous. The staff which was at command for the study and eradication of the disease is so small that the state officials felt it was preferable for them to give their entire attention to the detection of the disease in connection with herds of suspected animals which have been found to react. Such experiments would therefore cover a relatively larger number of reacting animals than would occur if the cattle were tested throughout the state at large. The consequence is that we cannot take the data which have been accumulated under these circumstances as representative of what is actually present in Wisconsin.

Now, in connection with our work at the Experiment Station we have, in an educational way, attempted to spread information with reference to the tuberculin test. Through this medium we have secured a considerable body of data in which tests have been made upon herds in which there was no especial reason to consider that those herds were likely to contain tuberculosis, and therefore it would seem that data of this class is much more re-

liable, so far as the state at large is concerned, than that which was taken from suspected herds.

TABLE I.—*Tuberculin tests made on suspected herds.*

	Number of herds tested.	Number of herds showing reactions	Number of animals tested.	Number of animals reacting.	Per cent. affected.
State veterinarian, 1898-1900.....			588	191	32.5
Experiment station to 1900.....			323	115	35.6
Live stock sanitary board, 1901.....	43	34	807	242	30.0
Live stock sanitary board, 1-02.....	34	23	752	166	22.0
Live stock sanitary board, 1903.....	48	39	1,316	331	25.1
Live stock sanitary board, 1904.....	67	51	929	209	22.4
	192	149	4,693	1,254	26.7

TABLE II.—*Tuberculin tests made on non-suspected herds.*

	Number of herds tested.	Number of herds showing reactions	Number of animals tested.	Number of animals reacting.	Per cent. affected.
Under auspices of Exp. Sta., to 1901.....			935	84	9.0
Under auspices of Exp. Sta., in 1901.....	22	10	425	84	19.7
Under auspices of Exp. Sta., in 1902.....	14	5	306	42	13.7
Under auspices of Exp. Sta., in 1903.....	11	4	182	5	2.7
Under auspices of Exp. Sta., in 1904.....	33	13	688	44	6.4
Under auspices of Exp. Sta., in 1905.....	41	17	726	44	6.0
	121	49	3,262	308	9.3

I have presented in this table here a brief summary of the number of animals which have been tested and also the number which react, which have been secured under these two auspices. These figures represent the suspected herds, herds in which the State Veterinarian had reason to believe, before he made an examination, that the disease of tuberculosis already existed in those herds. The consequence is that a very much larger proportion of these animals were found to be affected than was the case in the work of the Experiment Station, which for the most part has been conducted upon nonsuspected herds. You will understand that this chart includes all of the examinations which we have made in the state, but by far the larger proportion of those were dairy herds.

The suspected herds are incorporated in this series of data. I

will not go over the details of that, but will only say that the average for the last five years in suspected herds was that about one animal in four was shown to be infected, whereas the number of animals which were found to be infected in the non-suspected herds, including all those that have been tested by our short course students, by members of the Farmers' course and by other people who have examined herds, in that class, the percentage of reacting animals is less than ten per cent.

Now, in addition to these data which I show upon this chart, I may say further that within a comparatively recent time, several towns have passed ordinances requiring all animals that furnish milk for direct supply, to be tested with the tuberculin test. The city of Monroe, for instance, is one of those in which such a local ordinance has been passed, and one hundred and eighty-five animals have been examined within the neighborhood of this city and the percentage of reacting animals is seven per cent. The city of Beloit last year had a similar experience, owing to the fact that one of the most prominent dairy herds which was supplying milk to that city, was found to be very badly affected with tuberculosis and a great many people became interested in this question, who under other conditions, perhaps would have neglected it. In deference to public sentiment, although there was no local ordinance to that effect, nearly all milk-supplying animals of this city, were subjected to the tuberculin test, and eight hundred tests have been made in the vicinity of Beloit with a finding of ten per cent reaction.

The city of Minneapolis, although not within the confines of our own state, may be also taken as representative of this line of work. That city two years ago passed a similar ordinance that all milk supplying animals must be tested with the tuberculin test before their milk can be disposed of in the usual way, and the per cent of reacting animals for the year 1903 was 7.25 per cent; the per cent of reacting animals for the year 1904, in which there were 4,300 head of stock examined, was 6½ per cent.

Now, these represent what we may call dairy conditions. Although the data are not large in comparison with the entire number of cattle in the state, they represent, so far as those special localities are concerned, what we may call fairly accurate

data, and I believe at the present time we are in possession of a sufficient amount of data to give us the means of making a very fair estimate as to how prevalent tuberculosis is in Wisconsin today. That percentage, I would say, would run somewhere between five and ten per cent. Now, when we compare that percentage with what is found in other states—in the East and also in other states around us, we find that most of this data has been accumulated under such conditions that it is impossible for us to determine with any considerable degree of accuracy just how prevalent the disease is, because in almost all cases in other states the data has all been thrown together; that is, the suspected as well as the non-suspected herds, and the consequence is we cannot get at any fair degree of comparison. In a general way I think we may say that the percentage of animals found to react in other states has been greater than in our state, so that I think we may say that is a hopeful sign so far as Wisconsin is concerned. We are certainly not in as bad condition as other dairy regions of the world.

Take, for instance, Denmark; in Denmark a few years ago the percentage of reacting animals to those which did not react to the test, was as high as forty per cent, and we look upon Denmark as one of the most progressive, and most important dairy regions of the globe. That condition has been brought about very largely through the fact that the rank and file of stock raisers and breeders did not take this matter to heart. It is one of the most vital questions that we can consider and while you are attempting to improve your breeds of stock you must not neglect this aspect of the question.

Now, one thing which is very marked in regard to this matter of tuberculosis is its irregular distribution. While we may say that about one animal in ten is likely to be affected with tuberculosis in our state, we will find nevertheless upon examination that this disease is very unequally distributed. I have distributed to the audience bulletins (Bull. 133, Wis. Expt. Station) showing the distribution of tuberculosis in suspected and non-suspected herds in Wisconsin and you will see upon page 7 of the bulletin a diagram which gives you an idea how prevalent tuberculosis may be in a herd and still no physical symptom be apparent. You will see from the comparative length of the black and white lines that in some instances a very large

proportion of even unsuspected herds reacted to the tuberculin test, and that is exactly what we found under ordinary conditions; we found many herds that were entirely free and then a herd in which the disease has gained an extensive foothold, sometimes thirty, fifty, seventy-five per cent of the animals actually being affected, although the appearance of the animals was perfectly healthy. When you are dealing with a disease of that class which is so insidious in its character, which is so difficult to recognize in its early stages, it increases very much the gravity of the proposition.

Now, is this disease more prevalent among our dairy stock than it is among other varieties of stock?

I think we may say from the data which we have at the present time that tuberculosis is no respecter of breeds any more than it is a respecter of persons; that the beef breeds are equally susceptible with the dairy breeds and while we do find upon analysis of our data that a larger proportion of tuberculous cases are to be found among animals that are used for dairy purposes rather than breeding purposes, or milk supply, this is simply a condition which is brought about by the environment in which those animals are placed. From the data which I have at my command I find from analysis that we have twenty per cent of dairy animals affected; eighteen per cent milk supply animals and eleven and a half per cent breeding animals.

The amount of data which I have of beef animals exclusively is so small that it is hardly worth while to draw any conclusions from it.

Whether an animal will acquire tuberculosis or not turns then not so much upon the breed of the animal as it does upon the environment in which that animal is placed.

Tuberculosis in a human being is distinguished from most diseases in that it is a disease which is contracted in the home, in the house. A person, for instance, following an indoor vocation is very much more liable to contract tuberculosis than one who lives out of doors. Among clerks and other people who live in doors, the disease is two or three times as prevalent as among farmers and gardeners. That is a condition which is brought about, not so much by increased susceptibility of the person working inside, as it is because of the increased opportunity for the contraction of contagion, and I think we may fairly say that

if tuberculosis is found more abundantly among dairy animals than among beef stock, it turns, not upon the breed, but upon the closer housing which these animals are likely to have.

Is this disease upon the increase? Do we find a larger proportion of animals suffering from tuberculosis in Wisconsin now than we did in the earlier years of this agitation?

My belief is that it is diminishing; that we are more than holding our own in fighting this dreaded scourge. It is true, unquestionably, that public sentiment is very much more awakened than it ever has been before. This last month we have sent out over three hundred lots of tuberculin among farmers for individual tests, an amount which exceeds by a considerable quantity anything which we have ever sent out before, so that this agitation with reference to this disease is having the effect that a very much larger number of animals are being tested than at any time in the previous history of our state and the results indicate that the percentage of reacting animals is steadily diminishing. The number of animals, for instance, in non-suspected herds in the year 1905 was 6 per cent; in 1904 it was 6.4. In the early years it ran up from 9 to 10 and as high as 19 per cent in some years.

I think it is safe to say that the disease is being held down rather than making active progress, and if that is the case, it is all the more necessary that we do not relax in our efforts in this direction.

A very important question is, how this disease is introduced into our herds? What are the ways whereby a herd becomes infected with this disease? We must remember at the very outset that this disease, as is the case with all other communicable diseases, has a certain definite and distinct origin; that there is a certain specific bacillus, a certain germ which is the cause of the disease, and tuberculosis cannot be produced unless that germ finds it possible to obtain access to the body. So that no kind of environment in and of itself will result in the production of the disease.

The nature of the environment has a great deal to do with the rapidity with which the disease spreads, but it does not cause the disease: it is only a predisposing factor and that cause is the tubercle bacillus, so that until an animal is brought in contact with a tubercle bacillus and that organism gain an entrance into

the body of a susceptible animal, it is impossible for the disease to exist.

There are two ways in which this disease is most frequently introduced; one is through the medium of the purchase of animals which are infected in the early stages, stages which are not recognized at the time of purchase and therefore the introduction of animals into the herd, unwittingly introduces this dreaded scourge.

Another method of introduction is through the medium of feeding infected skim milk from a creamery or cheese factory, either skim milk or buttermilk which contains the seeds of the disease. These are the two main methods whereby stock is brought in contact with the tubercle organism and either of them will be effective in introducing the disease into a herd.

So far as the purchase of slightly affected animals is concerned, this can be brought about in one of two ways: either by the purchase of pure bred animals in a laudable attempt to breed up and improve the strain which you are handling, you may thus unwittingly introduce through a pure bred bull or a high grade animal the seeds of the disease, or, it is often introduced through the medium of common or grade stock which very frequently are disposed of at public sales. The public auction is responsible in great measure at least for the distribution of this scourge. Some ten years ago I am confident that tuberculosis was more frequently distributed through the medium of pure bred stock than through the latter method, namely, the sale of ordinary, common stock at public auction. At the present time I am satisfied from our data that the reverse conditions obtain.

We have here in this state a number of breeding men who are paying especial attention to this matter, who recognize the absolute necessity of knowing beyond all question the condition of their herds and in a no inconsiderable number of cases, the breeders themselves have used the tuberculin test to find out the actual condition of their herds prior to selling any animals. We have data collected in one instance, where a single herd has been the means of disseminating the disease to sixteen other herds in these central western states; that is, in Wisconsin, Iowa and Minnesota. This condition arose entirely through ignorance, I believe. The owner of this herd did not know of the existence of tuberculosis in his herd and while he sold his stock, which

was a very high quality of stock, he also transmitted to these herds where this stock went, the seeds of this disease, which caused in some cases very large losses, running up into tens of thousands of dollars.

This condition, however, does not obtain so much at the present time, and I am of the opinion that the larger proportion of tuberculosis is introduced into our herds at the present time through the purchase of grade stock at public or private sales, more so than through buying pure bred animals. The greatest difficulty that we have to contend with is the indifference of the buyer. If a buyer, when he goes out to get an animal which will serve as a means of building up his herd, would use the tuberculin test as an indication or index to determine whether that animal contains the seeds of the disease, it would be possible to stamp out this malady, but the indifference of buyers both at the present time and in the past has been such that they have excluded this most valuable agent. Let me cite an illustration: Two or three years ago you will recall that we had a foot and mouth disease in the eastern part of this country, in Massachusetts. This disease has caused enormous losses throughout different portions of Europe, and the Government used such drastic measures as the wholesale slaughter of large numbers of cattle in New England. Here was an opportunity for people who were stocking their farms and who were all informed as to the advisability of this test, to take advantage of this tuberculin test as a prerequisite in bringing animals into their herds, and yet only one fourth of those people took advantage of that test. Until we can rouse the buying public to the importance and necessity of using the tuberculin test, it will be impossible to expect the state to make such progress in stamping out this malady as it should.

Public auctions, in my judgment, at the present time are more important factors in the dissemination of this disease than ever before, and this is brought about through the fact that at the present time the disease has been established in so many different foci. So many different herds have become involved, and the opportunity for the transmission of the disease is very much greater than it was in the early years when the native grade stock of our farms had very much less of it.

Now, I believe in matters of this sort that the best pedagogical principle we can employ is to use a concrete illustration which will impress itself upon the minds of the public, and so I want to bring before you this afternoon a single illustration of this sort of the influence which the public auction can have and may exert upon the dissemination of this disease. The chart which I have here gives the figures as to a herd which was owned by a farmer in one of our southern counties. The farm was occupied by a tenant, they were unable to agree in regard to the disposal of stock and so they resorted to the usual means of a public auction, to sell the stock and then divide the proceeds. The man recognized that he had some very valuable animals and he had one of his friends buy back some of those which he supposed to be the most valuable. The tenant also selected a number of the animals from this herd and bought them back and took them off onto another farm. The remaining animals were sold to ten or twelve other farmers, most of them in the vicinity. This sale was made in the month of October. In the next February, just about a year ago, one of these men who had bought five head of cattle from this herd and introduced them into his own herd where he already had sixteen animals, in applying the tuberculin test found that three out of the five reacted. A neighbor across the street hearing that the test was to be applied, brought his one animal over which he had also purchased at the same time and it was found that this cow also reacted to the tuberculin test. Putting these two things together, it seemed probable that this original herd must have had tuberculosis present, so an attempt was made to find out just exactly the condition of the herd. A test of the 13 herds into which animals from this original herd had been introduced, showed that 12 out of the 13 had brought this dreaded scourge into their own herds by buying cattle at this auction.

In the following table the actual condition found is shown:

TABLE I.—Dissemination of tuberculosis into various herds by purchase of stock.

Herd.	Total No. animals in different herds.	No. animals from original herd.	Total No. of tuberculosis reactions.	No. of tuberculin reactions in animals purchased.
1.....	21	5	3	3
2.....	18	18	14	14
3.....	38	6	3	3
4.....	8	3	4	2
5.....	5	2	2	1
6.....	3	3	3	3
7.....	1	1	1	1
8.....	15	1	1	1
9.....	32	1	1	1
10.....	18	3	0	0
11.....	2	1	1	1
12.....	2	2	2	2
13.....	22	9	1	1

The result of this investigation was that the detection of this condition at that particular time saved that particular community from losses which would have aggregated thousands of dollars if it had run along unnoticed, so that instead of this single focus of disease, there would have been at least a dozen separate foci established, because it is absolutely impossible, so far as we know at the present time, to stop the progress of this disease after it has once become established.

That shows what a public auction may do with reference to the distribution of this disease.

It seems to me we can all ask ourselves whether or not legislation should not be had in our state with reference to this matter. The state is doing all it can to stamp out this disease. We have a statute on our books requiring a test of all animals brought into the state. Now, what can we do within the state? We certainly have this disease present. It is true it is not as severe in comparison with some other dairy regions as it might be, but we are doing nothing to prevent this man selling to another man, or this breeder selling to some individual and so distributing the disease wider and wider.

We are taking, for instance, our nursery stock, and having it examined by an inspector for the San Jose scale and for other diseases, which will result in loss if they become established on our farms, but we are doing nothing at present through the medium of legislation which will prevent the distribution of

disease in this way. I throw it out simply as a suggestion as to whether or not the time is not approaching when we should have some legislation along this line.

We have spoken of the methods of infection, of the possibility of infection through skim milk or butter milk. Now, not all the milk of reacting animals is actually infectious at the time that the test is made; there is in all probability not more than a quarter of the animals that actually respond to the tuberculin test whose milk is tainted with the tubercle bacillus,* but no man can tell at what particular time the animal may pass over from the earlier stages in which the milk is free from diseased germs, to that condition where the milk is actually infectious, and the consequence is we must treat the milk in all reacting animals in such a way as if it contained tuberculous organisms.

If the percentage of this disease was as large in our state as it is in Denmark, we would be obliged to treat every drop of skim and butter milk in such a way as to destroy these bacteria, and that suggests the question whether we should not have legislation requiring the pasteurizing of the whey, skim and butter milk which comes from our creameries so as to kill the tuberculosis bacilli. We have evidence that the disease is sometimes introduced among younger animals through the feed rather than through the lungs, through milk which had been taken to the creamery and there mixed with the milk of other parties and brought back to the farm.†

In one case we know that three herds whose milk was delivered at a certain factory were affected with the disease, and the milk supply was infected in this way, and the disease introduced in other herds through the skim milk.

Do you know at the present time that tuberculosis in hogs is increasing with greater rapidity than it has ever been known to do in regard to cattle? In the last ten years there has been an increase of over five hundred per cent of this disease in swine,

*The percentage of udder tuberculosis is usually very small, not more than a small per cent, but animals not affected in the udder may give off tuberculous bacteria in their milk.

†Since this address was given, we have collected evidence in co-operation with the State Live Stock Sanitary Board, in which it has been conclusively demonstrated that several creameries in this state have been spreading tuberculosis to young stock by means of infected skim milk.

and it is more largely intestinal than it is pulmonary. We do not say that it is all due to skim milk, because there is such an increase in non-dairy districts, but whatever the true cause is, there is no question as to the fact that the creamery method of distribution is of importance.

It is possible for us to eliminate this sort of infection entirely by heating the skim milk by the exhaust steam so as to destroy the tubercle bacilli beyond all question. What is done in Denmark is to heat every drop at a temperature which will kill the tubercle bacilli before this milk is taken back to the farm; the laws are enforced on that subject.

In this matter it is not necessary to rely upon the opinion of the individual buttermaker, whether he has sufficiently heated the milk or not, because there is a positive test that will enable the inspector to tell in a moment or so whether the milk has been heated to a high enough temperature or not.

I am thoroughly in favor of legislation which will put into the hands of Dairy Commissioner Emery, a law which will enable him to test the skim milk at every factory to find out whether it has been sufficiently heated or not, and in that way regulate a possible scourge of that sort. Besides freeing the skim milk from the dreaded tubercle, this process will also improve the general quality of the milk, because of killing out many of the gas-producing bacteria that now impair severely the quality of our products.

Another question that we will turn our attention to very briefly is the recognition of this malady.

We never miss an opportunity before an audience of this character to speak a word in regard to the tuberculin test, because it is the one agent that we have at our command which enables us to separate the slightly affected from the perfectly healthy animals, and it is therefore of the utmost importance if there is any one in this audience who does not know how to recognize the presence of this disease, that they become acquainted as soon as possible with this test.

In tuberculosis, we have a disease that is so insidious in its development, so long a period of incubation, the disease in the earlier stages is devoid of characteristic symptoms, that it is beyond the power of the ordinary man, or the most skilled expert, to detect its presence at an early date. There is no man

that can ascertain by physical examination, with certainty, whether an animal is affected or not. In the tuberculin test, we have an agent which is so far superior to the ordinary man's judgment that it should be given precedence over all other methods of diagnosis, and fortunately it is a method very easily applied. Even in the hands of a layman with a very little experience, it can be applied in such a way as will enable him to tell with a great degree of accuracy whether his animals are affected or not.

In this bulletin (No. 133, Wis. Expt. Station) of which I spoke there is an appendix which gives very briefly the details of the tuberculin test, its manner of application, and I believe we can do no more for the stock interests of the state than to spread the information with regard to this test just as far and wide as we can to encourage in every possible way the use of the test as a means of detecting the actual condition of one's herd.

The diagnosis of tuberculosis is a most important question. It is of great importance that each one of you consider personally this question: "Is my herd free from this disease, or may it possibly be infected?" And the only possible way in which you can answer that question with any degree of accuracy whatever is to have the tuberculin test applied to your herd.

That then is your first duty. Your next duty is, that if you find your herd free from disease, never to buy an animal unless that animal is subjected, first, to the tuberculin test. You may buy it from some man who sells on that basis—there are breeders whose herds are tested once or twice annually, so that you can buy animals that are known to be tuberculosis free.

On the other hand, you can take your chances, but before that animal is admitted to the remainder of your herd, test it every time in order to find out whether it is or not. We make this a uniform practice at the Experiment station.

There is not a year passes in which we do not reject animals that have been bought from outside. Sometimes we are unable to buy them on the basis of the test, and those animals are held in quarantine until the test is first applied. In that way our herd remains free from tuberculosis, simply because we use the test as a door through which every animal passes into our herd, and in this way we can keep out this most dreaded scourge absolutely and entirely. There is one other point that I wish to

call attention to in connection with this matter, and that is what influence environment has upon the spread of this disease? Is there anything in our methods of handling the stock which increases the ability of the disease to spread from animal to animal in our herds more rapidly than otherwise—anything which diminishes the resisting power of the animal?

These are factors which are of a general hygienic or sanitary significance.

The same principles which apply to tuberculosis in the human being are equally applicable to this disease among stock. If there is any one thing concerning which our knowledge with reference to tuberculosis in the human being is positive and certain, it is that such conditions as overcrowding, poor ventilation, poor food, lack of sunlight, overwork,—conditions of that sort are the most powerful predisposing influences with reference to the disease in the human being.

Where do we find tuberculosis in the human family most abundant? Not in the homes of the rich or the leisure class. It is primarily a disease of the masses, of the lower strata—not exclusively so, but tuberculosis in the tenement districts of our large cities is five times as great as it is in the middle stratum of society, simply because the social conditions which surround those people are such that if the tubercle organism is introduced into their midst, it thrives more rapidly and the opportunity for the distribution is very much increased. Frequently the same conditions prevail with reference to stock—the overcrowding, the imperfect ventilation, the lack of sunlight—all are factors that favor the development of the disease.

We had an illustration of this last year in our state—one of the worst cases of tuberculosis which we have ever found. A man in the southern part of the state having a herd of some seventy-two animals was carrying the milk of that herd to a Swiss cheese factory. The conditions on his farm, and, particularly in his cow barn, were simply beyond description. The manure in the barn was a foot and a half thick, there was absolutely no provision for ventilation; there were five little windows about one foot by three, and four out of those five windows were boarded up. It was impossible at noon to read newspaper print in that barn, and the stench was so strong it was almost impossible for a person to stand it for more than a moment, and

still those were the conditions under which seventy-two of those animals were crowded into close quarters, where, if the disease organism was present, there could be no more ideal conditions for its development. Here the tuberculin test was applied, and sixty-nine out of seventy-two of those animals responded, and it was absolutely impossible to utilize the carcasses. Every one was killed upon the place and buried in a ditch.

That condition did not produce the disease, but it did function in the more rapid development of the disease. It was this condition which furnished fuel for the flame; the necessary match to start the fire was the tubercle bacillus, but here was the dry tinder, the kindling, and when the match was applied the flames swept with unwonted fury. If no spark falls, the fire cannot start; if you do not have the tubercle bacillus, the disease cannot begin its work; but if the match is dropped into dead leaves and grass, favorable conditions of environment, there is nothing that will stop a widespread devastation.

In this brief space of time we have considered the economic aspect of this question, looking at the problem from the standpoint of the dairy farmer. Can you afford to allow this disease to be present in your herds?

We have ignored entirely the sanitary or hygienic aspect of this question, simply on account of lack of time, and this is a phase of the question which is very important. The inter-relations between the bovine and the human, the possibility of human life being affected by the tubercle organism coming from milk is a phase of the question we cannot touch today. We are looking at this question simply from the standpoint of the stock-raiser—whether you can afford to have in your herds the seeds of this disease.

This is unquestionably the worst scourge with which the stock-raiser has to contend in Wisconsin today. Its insidiousness invests it with a special danger. If it was a disease which raged as does black leg or anthrax, the gravity of the proposition would not be nearly as great as it is, on account of its unseen method of development.

We cannot afford to spend the time and energy each year as stock-growers in breeding up and improving our herds, unless we take precaution first to find out their actual condition. We should take the experience of others and profit by what others

have found with reference to this matter. Here is a case where foresight should be exercised in place of hindsight; here is a place where the experience of the man should be heeded who has had tuberculosis in his herd—and no man who has ever had this disease in his herd wants to get it again. The only way, so far as I know, that we can be sure in the matter, is to start at the bottom, determine the actual condition of affairs by means of the tuberculin test, and then use the test consistently and continually.

In closing I will call your attention to a number of tissues which have come from tuberculous animals. Last week there was a herd condemned by the state veterinarian in the vicinity of Lima, in which over fifty animals were found to be infected. They were shipped to Milwaukee for slaughter and Dr. Roberts has kindly sent out some of the tissues for inspection.

DISCUSSION.

Ex-Gov. Hoard: I want to ask you, after you have demonstrated the presence of tuberculosis in a herd and you have extirpated it—killed off the animals—what will you do with the situation in the stable to prepare it for the occupancy of healthy animals?

Prof. Russell: It is absolutely necessary, after the animals have been disposed of, that the stables should be adequately and efficiently disinfected. It is perfect folly to wipe out the herd and then put another into the same stable. This disinfecting can be readily done by the use of ordinary disinfectants—we have a bulletin upon that point that we will be glad to send to any one. It would take considerable time to go into the general matter of disinfection.

Ex-Gov. Hoard: Would it be sufficient for a man to drench that stable thoroughly with hot whitewash?

Prof. Russell: Whitewash may be used for part of the work. In the first place, it is necessary to remove all loose stuff and get down to the woodwork of the stable itself. Clean out thoroughly all loose material. Then the mangers and feed boxes should be washed with something stronger than white-

wash—something like formaline—about 5 per cent; or, if corrosive sublimate is used, it should be about one part to 500. Solutions of corrosive sublimate, however, must be made up in wooden utensils, not metal.

So far as general barn disinfection is concerned, whitewash is very satisfactory, but it must be used thoroughly, and made from fresh, not air slaked, lime.

Mr. Hickox: What do you know about bovovaccine?

Prof. Russell: That is a new remedy that has been discovered recently. Prof. von Behring has been working upon a cure for tuberculosis, and bovovaccine is a means of vaccinating the animal so that it will not acquire tuberculosis. It has to be introduced by an expert veterinarian into the jugular vein of the animal when the animal is a calf, two injections are made. Such animals become resistant to the power of the bacillus. It is more a prevention than a cure, although the remedy has not been upon the market long enough to establish thoroughly its claims. We must wait until it is further tried.

Mr. Goodrich: Do animals ever recover from this disease when once contracted?

Prof. Russell: I have never seen a case in which I was certain of any real recovery. It occasionally happens that animals will apparently respond to the tuberculin test and upon repeated investigation fail to respond. In such a case the question is always as to the accuracy of the first test.

Mr. Goodrich: Do they not live sometimes several years after they have the disease?

Prof. Russell: Animals will live for a period of five or six years or even longer and be in apparently good condition. The disease, however, is there, in latent, dormant condition, and at some time, generally owing to some local influence, it passes from the chronic to the acute form, and then the affected cattle will run down very rapidly, so that such an animal may be in the herd a number of years, spreading the disease and yet show no signs of it.

Mr. Race: Where tested animals are killed, does the owner stand all the loss?

Prof. Russell: No; one method is that the animals are to be appraised by three appraisers from your vicinity and the state pays one-third of appraised valuation. Another method is

to have them shipped to the government abattoir, where they are slaughtered under government inspection and the owner receives the entire proceeds.

Then again, there is the method of quarantining very valuable animals and breeding healthy progeny—it is a positive fact that you can raise a healthy calf out of a diseased mother, providing you do not use the milk of the mother in an unheated condition.

SCORES ON DAIRY PRODUCTS.

Read by Secy. Burchard.

Cheese.

Exhibitor's Name and Postoffice Address.	Flavor 45	Texture and stock 30.	Color 15.	Finish 10.	Total 100.
Otto A. Kielsmeier, Manitowoc	44½	29½	15	10	99½
Alex Bruhn, Spring Green	42	28	15	10	95
Johannes Bros., Green Bay	35	26	15	9½	85½

Butter.

Exhibitor's Name and Post-office Address.	Flavor 45.	Grain 25.	Color 15.	Salt 10.	Packing 5.	Total 100.
Helendale St'k Farm, Athens	43	25	15	10	4½	97½
John E. Boettcher, Janesville	43	24	15	9	5	96
L. G. Heimerl, Wales	43	24	15	10	5	95
W. F. Hyne, Evansville	40	25	15	10	5	95
A. E. Puerner, Jefferson	42	23	15	9	5	94
Wm. F. Krohn, Whitewater ..	41	24	15	9	5	94
E. A. Paddock, Elkhorn	43	22	13	10	5	93
Murphy Bros., Waukesha ...	40	23	15	9	5	92
C. H. Wilde, Calhoun	39	24	15	9	5	92
John W. Hawton, Waukesha	37	23	15	9	5	89
A. E. Dixon, Evansville	36	22	15	9	5	87

ALFALFA, ITS VALUE AND HOW TO GROW IT IN WISCONSIN.

F. D. Coburn, Secretary Kansas State Board of Agriculture.

Mr. President, Ladies and Gentlemen of Wisconsin: I can assure you it is a very great pleasure for me to appear this afternoon before this splendid audience of splendid men and women.

I am a native of the county west of you and so I am merely coming home today. I beg you to understand at the outset that I do not appear before you in the capacity of a professor nor a chemist, nor even a college man. When I should have been connected with a college I was fortunately or unfortunately down in the swamps of Arkansas with a gun, trying to coerce the Southern Confederacy into the union.

I have been invited to talk to you about alfalfa and its bearing on agriculture and dairying and these kindred interests. The subject is too big for any one man to handle in any one day and so I shall touch the high places and deal in glittering generalities.

As most of you know alfalfa is no new plant. It is as old as history and has been grown in a greater or less degree in some countries from the beginning. It is relatively new in this country; possibly we have had it a hundred years or more, and it probably came up to us from South America, possibly up along the Pacific coast and found its way into California and New Mexico.

The facts about alfalfa seem to be that nobody dares tell the whole truth about it, or perhaps more than half the truth about it, without being set down as about the biggest liar on earth. Alfalfa, unquestionably, is the greatest forage crop that grows out of the ground. It has no peer so far as we know. It has no rival in its line. Another feature about it is that those who know it best believe in it most; it is only those who don't know alfalfa and haven't had anything to do with it who are incredulous.

Furthermore, it has been discovered in recent years that it will grow anywhere. The theory that it would only grow in certain localities and under certain favorable conditions has been entirely exploded, and it is being grown now in every part of the country, in every state, and grown successfully. It is no longer considered impossible in any part of this country, and those who have tried it most are the best witnesses to that effect.

Up to within a very few years it was an orthodox proposition in Kansas and the West that it was no use to sow alfalfa where cottonwood trees would not grow or where corn would not flourish. There is nothing in that. Alfalfa grows everywhere, it grows out on the high plateaus of the West where there are only fourteen inches or less of rain in a year; and yields immensely down in Louisiana, where they have sixty-five inches. It grows in New England, it grows in Alabama, it grows in Virginia, it grows in Manitoba, it grows in Minnesota, and, as you all know, it grows successfully in Wisconsin, under proper treatment.

We all know that until recent years red clover has been the great staple crop; we talk about clover for hay, for fertility and for restoring certain kinds of land, and so as that has been the standard, nothing is more natural than that we should compare any forage crop that is new to us with red clover. Red clover in most parts of the United States where alfalfa is a stranger is ranked as the richest and best yielding forage, and the fertilizer and renovator par excellence.

The Massachusetts Experiment Station, after a series of tests, reports that 100 pounds of clover contain 47.49 pounds of digestible food and 6.95 pounds of proteids, while 100 pounds of alfalfa contain 54.43 pounds of digestible food and 11.22 pounds of proteids.

The New Jersey station reports that the average yield per annum of green clover to the acre is 14,000 pounds, and of green alfalfa 36,500 pounds; the protein in the clover is 616 pounds and in the alfalfa 2,214 pounds; one ton of alfalfa has 265 pounds of protein, and clover only 246 pounds. But alfalfa will produce three, four or more cuttings each year, while clover will produce but one, or at most two. Further, clover will ordinarily survive but two years while alfalfa will last from ten to one hundred, thus saving many plowings and seedings. It is also estimated that the stubble and rootgrowth of alfalfa are

worth at least four times as much for humus as are those of clover, while the mechanical and other beneficent effects of the long alfalfa roots far excel those of clover. The alfalfa field is green for pasturage a month earlier in the spring than clover, and may be mowed a month earlier. It starts a vigorous growth at once after cutting, covering the ground with its luxuriant foliage before the second growth of clover has made any substantial progress.

Alfalfa has one of the most wonderful root systems of any plant that we know anything about. As a matter of fact, nobody knows how far down into the earth they go. A government engineer reported an instance in Nevada where alfalfa roots were discovered one hundred and twenty-nine feet long. He did not bore down into the bowels of the earth one hundred and twenty-nine feet to find this out, but there was a tunnel through a mountain, in a rocky formation containing cracks and crevices, and the observer noticed coming down through the roof of the tunnel a large number of rootlets from some source, and there was no way of accounting for them, except that they came from an alfalfa field on the surface, one hundred and twenty-nine feet above the tunnel. I believe that about the farthest anybody has had the courage to follow alfalfa roots down with a spade has been somewhere from twelve to twenty feet. At the same time I believe there is no record of any one following a well developed root down and finding the end of it.

A further peculiarity of these roots is that they are of considerable size and of great numbers, and they bore down into the soil to depths no other roots reach, and they not only utilize for their own growth the mineral and other elements of fertility down there, but they bring them to the surface, and eventually these roots decay—the process of decay is going on all the time as well as the process of growth, and wherever these decay, whether the alfalfa is plowed up or not, and especially so when the alfalfa is plowed up—they are a source of great fertility in themselves, they leave the soil full of openings into which the rains penetrate and the humus and fertility from the surface are washed, and the soil is renovated and made over in that way. Then, again, these roots, with their bacteria and the nitrogen they gather, afford a remarkable source of fertility, and so the man who raises alfalfa, instead of robbing the soil, depleting it, skin-

ning it, is enhancing its value every year. No one can tell to just what extent the value per acre of that land is enhanced when it is once set in alfalfa.

In my country they estimate the increase in its value anywhere from \$10 to \$50 an acre by having the land well set in alfalfa, and I may say that in Kansas there are lands that a few years ago could hardly be sold for any price—they were a glut on the market at \$1.25 an acre—which are now producing profitable crops of alfalfa and are selling to men from Wisconsin and Minnesota and elsewhere at from \$30 to \$50 an acre. That is what alfalfa is doing for our country.

Another thing about alfalfa—it is good for all kinds of farm stock, no matter whether they are Percherons or pigs, or cows or chickens, they all like alfalfa and all thrive on it. As to its qualities, you are all familiar with wheat bran and the experiment stations seem to have demonstrated that alfalfa, pound for pound, is nearly as good as wheat bran, and it is stated from the stations, too, that one ton of the leaves of alfalfa is worth as much for feed as 2,800 pounds of wheat bran.

I should let fall a suggestion here—if you don't want lots of work don't fool with alfalfa. Our Professor Cottrell went to a farmers' institute down in the southeastern part of our state and talked alfalfa to people who were sure it wouldn't grow there—and you have missed half your life if you have not heard Cottrell talk alfalfa—and one man stopped him and wanted to ask him some questions and seemed much interested. Well, the professor helped him all he could, and five years after, being in the neighborhood, he went to that man's place and met his wife. She looked at him suspiciously, and at last recognized him as the man who put her husband up to sowing alfalfa, and she says, "I want you to get away from here. My old man followed your advice; he sowed a lot of alfalfa and we haven't done anything since on this farm but make hay." Some of you men will know how to apply this story.

It is no use sowing alfalfa on swampy land, where the water is near the surface; alfalfa won't stand wet feet. The roots of no plant that I know anything about will work harder to get to where there is water for their sustenance than those of alfalfa, but if the roots stand in water it will perish, and it is a waste of time to sow it on land that has not a fair degree of natural

drainage. Furthermore, it is no use for you to sow alfalfa on land not in first class condition—in such condition as you would have an onion bed. If you are not enough in earnest to put your land in that condition, leave alfalfa alone. It is worthy of, and deserves, the best preparation that your land can have, and in order to succeed well it must have it. It must be loamy and fine. Do not sow alfalfa in a soil light, loose and friable. The soil has got to be sufficiently packed so that the rootlets can get a foothold; if they can't do that they haven't much to go on.

The real way to have success is to begin two or three years before sowing it, by getting the weeds and weed seeds out of your land. If you can't get the field cleaned up, free from weeds, don't sow alfalfa. I have been wondering which is the more important factor in connection with sowing this crop—the man or the seed. I wouldn't be surprised if it was the seed. You can't do anything, no matter how hard you work, without good seed, and perhaps every one who has sown alfalfa knows how hard it is to get just the right kind of seed. It behooves every one to use all due precaution, every effort to get seed that is pure, that is clean, and that is germinable. I did not say seed that is new, because so far as experiments show it seems that germinability in alfalfa seed is not greatly affected by a few years' time. I am advised by the best authorities that know anything about that, that alfalfa seed which is all right to begin with will only depreciate in its germinability from one to one and a half per cent in five years—if it is kept under favorable and proper conditions of storage.

The government at Washington has been paying no little attention to this seed problem, especially the imported seed. Some years ago we exported two or three million pounds of seed, but in more instances we import it. It mostly comes from Germany or German ports. The government has been keeping tab on some of these imported seeds, and congress, at the last session I believe, authorized the Secretary of Agriculture to investigate the seed that is on the market, especially imported seed, and find out to what extent it is adulterated and filled with impurities, and so the government agents have picked up seed as found in the different markets in different states, and here are a few of the results as published by the department of agriculture. They give the names of the seedsmen who have sold this seed and where

they are located. It is not necessary to mention names, but here are some of the results:

A firm in Rhode Island was selling seed that had nearly 33 per cent of one kind of weed seeds; nearly $3\frac{1}{2}$ per cent of another kind of impurity. Another had $38\frac{1}{2}$ per cent; another $44\frac{1}{2}$; another $43\frac{1}{2}$; another 31.77; 45.73 percentage of adulterants, and so on—these large percentages of impurities and adulterants when you are paying for pure seed. One sample of this seed was from Troy, New York; another from Indianapolis; one from Milwaukee, and I am pleased to say that the Milwaukee sample had, all told, less than 6 per cent adulterants; one from Denver, about 17 per cent. Three of the very worst are from Indianapolis and one from New Haven, Connecticut; this last was nearly half adulterants.

I think I must give credit to the Milwaukee man, W. E. Dallwig, 34 Juneau avenue, whose seed contained the lowest percentage of adulterants in the list—less than six per cent.

The government has been testing large lots of these imported seeds—twenty to thirty tons—samples taken right out of these large lots. In one sample there were found in a pound of this seed 16,000 weed seeds; in another 32,430; in another 17,299; in another 16,435—mark you, not in a bushel, but in a pound. In another nearly 22,000; in another 23,000; in another 21,000, and so on, and in some of these the percentage of alfalfa seed that would actually grow was found, in one case, to be as low as seven seeds out of a hundred. In other samples they ran as high as eighty-four.

Here is what they found in the way of dirt—not adulterants, but broken seed and dirt; in one instance was 16 per cent; in another $21\frac{1}{2}$; in another $34\frac{1}{2}$ and in another 72. That last was in a consignment of $6\frac{1}{2}$ tons in one importation, and only $6\frac{1}{2}$ per cent was alfalfa seed that would grow, the rest being worthless.

The Ohio station at Wooster has been experimenting along these lines. They went into the market and bought samples—a dollar's worth each from different places under different conditions, and tested them, and the quantity of germinable seed was found to range from 5.1 pounds to 9.3 pounds in a dollar's worth; the number of noxious weeds found in a dollar's worth of supposed alfalfa seed ranged from 360 to 185,940. Seven of

the fifteen samples each carried more than 23,000 noxious seeds. So, when you go into the open market, you see what you are liable to get, and then it doesn't prosper and you don't prosper and you lay it on the alfalfa, saying that it won't grow in Wisconsin. Seed bought at \$7.80 per bushel showed as low as 61.2 per cent that was germinable, so that the actual cost of that good seed was \$12.74 per bushel. Nine of the fifteen samples had less than 77 per cent of germinable seed. One pound sample contained 21,728 noxious seeds, of which 18,144 were lamb's quarter or pig weeds; the same pound also had 3,136 seeds of dodder. Another pound carried 6,420 seeds of crabgrass and one had 3,325 seeds of foxtail. If you are sowing that kind of seed, it is not remarkable that your alfalfa does not prosper. The Ohio station recommends that no alfalfa seed be sown until it has been screened carefully through a screen of twenty meshes to the inch, to remove dodder seeds.

I want to say, as an outsider and observer of things, that you have here in the state of Wisconsin some of the worst blow-hards on earth; they will advertise their seeds to do anything that you want done—if they can find out what that is, and it is not necessary for me to mention the names—you want to look out for those fellows who are flooding the country with catalogues.

I have here a suggestion from a government bulletin as to how these seeds are handled by certain seedsmen, how the dead seed and screenings are mixed with the good seed to the profit of the dealer: The cost of 100 pounds of this worthless seed is \$2.00; the cost of 100 pounds of good seed is \$15.00, making \$17.00 for the cost of the mixture. He gives you a great bargain by selling you a mixture at \$12.00 per hundred weight, or \$24.00 for the 200 pounds, he making \$7.00 profit on the deal.

Mr. Aderhold: Why can't we raise the seed?

Mr. Coburn: My counsel to you would be not to bother with attempts to raise seed. If, for instance, you let the first cutting ripen seed, you have pretty nearly knocked your alfalfa crop for the rest of the year out of the running; the effect seems to be very debilitating.

Mr. Aderhold: The yield of hay per acre is much more valuable than the seed?

Mr. Coburn: Possibly; it depends somewhat upon the environment.

Mr. Rietbroek: How can we get seed?

Mr. Coburn: There is plenty of seed in the market. **Don't** put off till sowing time getting your alfalfa seed. If you are going to sow it next August, look it up now.

Ex-Gov. Hoard: We must sow it here at least by the **first** of June in order to get root enough to go through the first winter.

Mr. Coburn: But it is coming to be the almost universal testimony, so far as I know, in the Trans-Mississippi region, that the thing to do is to sow it in the fall. Spring sowing west of the Mississippi has largely gone out of vogue. If you want to experiment with alfalfa and if you want to sow it in **June**, this is a good time to begin to look after your seed and do not buy it or sow it without having it tested. As far as I know, **any** experiment station will test your seed for you if you will send samples, but be sure not to buy alfalfa seed without having it tested, and with a guaranty.

Ex-Gov. Hoard: The trouble about that is if you send to a seedsman and ask him to send you a sample of good seed, that tests all right, what guaranty have you that that man will send you then, on your final order, seed as good?

Mr. Coburn: I can't say; that is one of the problems we have to meet.

Now, about the kinds of seed. You will be told about the Turkestan and perhaps twenty other different kinds of seeds. The Turkestan alfalfa was very widely exploited but it has hardly made good as a superior variety and there is no "dry land" alfalfa, such as we have seen advertised; no one sort that will especially flourish on the high plateaus of the west.

You have heard about the experiments that have been made in the last month or two at the Kansas experiment stations at Hays City, out on the plains, and have been told that there is a variety that would grow almost without any moisture at all. That statement has never been made on authority, no such discovery is pretended to have been made, and nine-tenths of this talk is wild. There is no one variety of seed that is better than others. I should counsel that you buy alfalfa seed grown as nearly as possible under your conditions and along this latitude; do not sow seed here which has been grown under entirely different conditions, say down in Louisiana or Mexico, or under irrigation.

Ex-Gov. Hoard: Northern Nebraska, northern Kansas and

from there north to Wyoming and Montana give us the best seed we can find.

Mr. Coburn: Now, as to the quantity of seed to sow: There is a great difference in the quantity required on account of these adulterations I have been telling you about. We are obliged to sow a large quantity of such seed, and when I say large quantity, I mean thirty pounds. If all your seed grew and you sowed twelve pounds, the plants would be so thick that they would destroy themselves in the first season; they would be thicker than the hair on a dog's back. Under reasonably favorable conditions and the right kind of seed as to cleanliness and germinability, twenty pounds would be thousands and thousands too much.

(The discussion was interrupted by Secretary Burchard for the purpose of introducing to the convention Governor Davidson, who had been in the convention for a brief visit, but was obliged to leave to meet another engagement.)

The Chairman: This question has been passed in on this alfalfa matter. Perhaps some of these gentlemen can answer it. "In the discussion on alfalfa, this afternoon, the question of soil inoculation will come up. I have seen it stated that where sweet clover grows thriftily, inoculation is not needed. As you know, sweet clover is a pest along most of the highways in town, and I would like to know whether that is an indication that our soil is in proper shape without inoculation."

Mr. Coburn: Alfalfa requires a special sort of bacteria for its prosperity, and the bacteria that is suitable for the other legumes is not suitable for alfalfa, but it happens that the bacteria pertaining to sweet clover agrees exactly with that of alfalfa, so that wherever sweet clover is growing, that soil is inoculated, and it is just the thing that you need, if you haven't anything more convenient, to scatter on your alfalfa field to inoculate that soil. In other words, the best assurance that you can have that alfalfa will flourish in a given neighborhood is that sweet clover is flourishing there. If it is you need not send to Washington or elsewhere for inoculating material. Sweet clover is a hardy, persistent plant, and it will grow sometimes where nothing much else will grow. The soil where it grows is properly inoculated for alfalfa.

Ex-Gov. Hoard: Sweet clover is a biennial. Now, just a

word about this inoculation. Soils in many localities have not the elements or bacteria or inoculation which alfalfa needs and the alfalfa does not flourish well, while all the other conditions may be favorable.

Mr. Hodgson: We have found it is possible to raise alfalfa without inoculation by taking the roots and transplanting them and we raise alfalfa all right.

Mr. Coburn: You cannot sow alfalfa seed in every kind of ground and expect it to grow all right, but many millions of acres are so conditioned, so inoculated naturally that alfalfa will grow to great advantage.

Mr. Race: Would you sow a nurse crop with your alfalfa?

Mr. Coburn: In our country the nurse crop idea is absolutely exploded, nobody does it. We want to give the alfalfa every chance, as it is a wonderfully delicate plant.

Prof. Henry: What is the best method of sowing?

Mr. Coburn: The general custom is to sow with a drill. A drill is not made that will not drop too much seed unless something is mixed with it. Sometimes it is mixed with corn chop. Sometimes we harrow the seed in one way and then cross-harrow.

Ex-Gov. Hoard: In front of the drill, we have a seeder in which the alfalfa is put that will gauge it down to nine pounds. The drill comes along and sows the grain in the drill just ahead of it, scattering the alfalfa.

Mr. Coburn: We do not sow any other seed with alfalfa.

A Member: To what depth should the seed be put in the soil?

Mr. Coburn: About one inch. The idea is to have it deeper rather than shallower.

A Member: What do you do to keep out the June grass?

Mr. Coburn: Why, the great tonic for alfalfa always and everywhere so far as I know is to disk it with the disk harrow and to mow it. In my country it is the uniform practice to use the mowing machine and the disk harrow, and if there is anything the matter with your alfalfa, disk it.

Ex-Gov. Hoard: Do you mean disk it in the spring or after each mowing?

Mr. Coburn: Yes. I have verified the statement of a man in Oklahoma who last year made nine cuttings of alfalfa, carrying fourteen tons per acre, and he disked that alfalfa each time after seven of the mowings, seven times.

Ex-Gov. Hoard: With the disk set pretty nearly straight?

Mr. Coburn: One great purpose of that disk is to split those crowns. Whenever you split a crown, each one of those split parts begins to put up new shoots. You set your disk harrow any way you want it. How you set the machine is optional with you. Sometimes for some purposes they will set at an angle expressly for splitting these crowns; they will set again relatively straight. The object of splitting the crown is to get more stalks, more stems. There are instances where as many as 360 stems have been counted from one root, or from one seed, if you please.

Mr. Race: Would not the condition of your soil make a difference in the depth you would sow? A man sowing alfalfa on a heavy clay soil with lots of rain, as we had last year, might fix it so they wouldn't come through at all.

Mr. Coburn: That is not impossible. No man can tell what the weather and the conditions are going to be. Of course, you cannot sow under any conditions in which you can guarantee it will come through; you have to sow it to the best of your knowledge, and let it go at that.

Mr. Meyer: Do you disk in the early spring before cutting?

Mr. Coburn: Yes, you disk any time you feel like it.

Mr. Race: I understood a gentleman to say that if he let the alfalfa go to seed, there would be a tendency to injure the plant.

Ex-Gov. Hoard: It would debilitate it.

Mr. Race: I attended an Institute last year and we had a discussion. There was a certain ten acres of alfalfa in my town that we thought was sowed on one of the poorest farms in the town, ten pounds to the acre sowed with oats the same as clover, and the second year they took off one crop of hay and one crop of seed. Mr. Scribner said that would be the end of that alfalfa field, as I understood, but that field came up this year to my waist, and I am not at all a short man.

Mr. Race: That field to my knowledge did not have any cultivation otherwise than what happens in the soil.

Paper on same subject read by Mr. J. F. Widmann, Ft. Atkinson.

MY EXPERIENCE WITH ALFALFA.

J. F. Widmann, Fort Atkinson.

The study of raising and handling alfalfa is one of great importance to the farmer and stock raiser. The study of alfalfa is of greater importance just now than the study of any other farm crop, not because it is of greater value, but because it is a comparatively new crop for the farmer, and also of its immense value to the farmer and stock raiser.

Any farmer whose land is adapted to the raising of alfalfa, can hardly realize what he is losing financially, if he neglects to study and grow alfalfa hay for his stock.

In the spring of 1902, I sowed six acres of alfalfa; the land, upon which I sowed the seed, had been cropped for a long time, and was not very productive. I did not fertilize the land at all. The field had been plowed in the fall; in the spring after I finished sowing my small grain, I took a disc harrow and worked the land into a fine seed bed, and then sowed the alfalfa seed at the rate of 30 pounds per acre. This field I sowed without any grain; the season was very favorable, and on the 14th of July I cut the first crop, which was about $\frac{1}{4}$ weeds; on account of the weeds it was slow drying the crop, besides we had lots of rain. This crop laid broad cast for six days; I would run the hay tedder over it, and shake it up and before night it would, generally, rain. One afternoon it was very dry, so I hauled it to the barn; this crop amounted to six loads.

I did not value this crop very much on account of the weeds, and what hay there was, was as yellow as straw. When I fed this hay I was very much surprised to see the cattle eat every spear of alfalfa. The second crop I cut the first of September, and had six more loads from the six acres.

During the following winter the cows did so well while I was feeding these two crops, that I concluded to sow twelve acres more. This twelve acre field I sowed with oats, sowing $13\frac{1}{4}$ bushels oats per acre. The oats yielded good, and the alfalfa caught well and made a good stand.

In the spring of 1904 I sowed twelve acres of barley, at the rate of two bushels per acre, one half of which I sowed with alfalfa and the other half with red clover. The alfalfa did

splendidly, but the red clover was a failure. Since then I have concluded to sow all alfalfa.

Last spring I sowed seven acres with barley, sowing one bushel of barley and 30 pounds of alfalfa seed per acre. This new seeding also looks well, so I will have twenty-seven acres for hay this year.

In sowing alfalfa, the first important step to success is the selection of a suitable piece of land. Select a piece of high land, upon which corn does well, and you will find that alfalfa will also do well upon it. Do not select any low land, for alfalfa will not do well upon it.

The next important step is the buying of seed. I consider this very important; too many farmers do not realize the danger of sowing seed in which there may be foul seed.

Seed that is A No. 1 generally costs two dollars more than common seed; the very best grade has no dried or shrunken kernels, or any particles of dirt or foul weed seed. The seed should be tested. I test mine in the following manner:

Take two hundred kernels just as they run and put into a glass fruit can. In the evening, about five o'clock, fill can about half full of water, let stand until about eight o'clock the next morning, then pour off the water and screw the cover with rubber on to the can air tight. In one and one-half or two days you can see just what the seed is doing. When the sprouts are $\frac{3}{4}$ of an inch long, take out the seeds and count the sprouted kernels and you can easily figure out the per cent of seed that will grow, and if 95% will sprout, sow it, and if not take it back and buy some more of a different dealer.

The price of alfalfa is about from \$8 $\frac{1}{2}$ to \$11 per bushel, which would cost about \$5 to sow 30 pounds or one-half bushel per acre. This seems high compared to the cost of sowing red clover. Red clover seed generally costs about \$8 and one bushel will sow five acres which will make the cost of seed for red clover per acre \$1.60.

Now compare the life of alfalfa with the life of red clover and the cost of seed will be in favor of the alfalfa clover.

In sowing the seed I use a grain seeder to which is attached a grass seeder. I set the grass seeder to sow 15 pounds and sow the field one way and then cross it so as not to leave any streaks between the seeder. I raise the teeth of the seeder, and drag

the field with a slant tooth drag. In sowing and dragging I use the lightest team that I have, so as not to have so large and deep foot prints in the field. I use this method of sowing with or without a nurse crop.

Sowing without a nurse crop you would be more sure of a good catch. I do not advise clipping to kill the weeds, when sown without a nurse crop, but let weeds and all stand until some blossoms appear on the alfalfa. In clipping to kill the weeds you are just as apt to kill some of the alfalfa.

Alfalfa is naturally a heavy yielding crop, the roots go down below the roots of any other crop raised on the farm. I have dug up roots that were six and one-half feet long, these I dug in a field three years old. The roots are about the size of large lead pencils and taper down to a hair, so you see the root has the power to reach and raise any fertility that has leached out of reach of any other farm crop. Red clover roots do not go down over 14 to 18 inches.

This year the first cutting yielded an immense crop. I measured one field and it measured $3\frac{1}{2}$ acres, and the yield was eight large loads hay of first quality, without a weed in the piece. My fields seem to yield better as they increase in age.

I do not wish to keep a piece longer than six years, because I wish to change about on the farm. I don't think that there will be any weeds left in the field after cutting three times a year for six years. I have always cut mine three times; you must leave the fourth crop standing as a protection in the winter. It is a hay that all kinds of stock eat with a relish and do well on it.

I am feeding 12 brood sows some middlings, milk and water mixed and the balance of their ration consists of alfalfa hay. It would do any hog raiser good to see these hogs stand up to a rack and eat hay like a lot of cattle. The hogs are doing fine and are not getting a kernel of corn. They were fed the same last winter and raised fine, large litters of pigs. Feeding brood sows this way is cheaper and better than when fed corn.

It also makes a good hog pasture; after cutting the first crop of a field of three and one-half acres. I turned in 100 hogs. The hogs could not keep the clover down, so I took them out on September 1st, and cut the crop for hay which yielded one load per acre. The hogs damaged the field considerable by rooting

and eating the crown of the plants. It is also a good food for poultry; chickens will roam over the alfalfa fields for hours at a time and get half of their living off from it.

I had one field that did not do just right, so I top dressed it during the fall of 1904 and the next spring this field yielded as good as any on the farm. I think it is a very good plan to fertilize the land before sowing to alfalfa, this will insure a better stand and the crops of hay will be larger.

Now, in regard to curing the hay, some of our best authorities advise using caps. I will not say anything about hay caps, because I have never used them. Now, I think that the recommendation of hay caps, by our best authorities, has a tendency to create a prejudice against the sowing of alfalfa, because they think that it must be terrible stuff to cure. These same authorities recommend the use of hay caps for curing red clover. For my part I would rather cure alfalfa clover than red clover.

Now, as to the right time to cut the first cutting, a man must use and exercise his own judgment. When the clover is very rank and heavy it must be cut early to make the hay as tender as possible. When the alfalfa is very heavy, I cut just as soon as I see a single blossom; this will make the hay tender and nice, and also gives the second cutting a good chance to make an early start.

The second and third crop I do not cut until a number of blossoms appear in the field. About four or five hours after cutting I run over the field with a hay tedder, and run the tedder every morning until the hay is fit to haul to the barn. If the weather is rainy, I would rather have it rained upon laying broadcast than to have it in windrows, or shocked or bunched up; and as soon as it is dried on the top I start the tedder and shake the water out of it. As soon as it is dry enough to haul, I haul with all possible haste. Sometimes I rake and bunch with a horse rake, and sometimes I load with a hay loader. Of course, the hay loader breaks off some leaves, but you would never know that there were any leaves gone if you did not see them fly while going up the hay loader.

Alfalfa hay never gets as dirty and dusty after a rain as red clover does; it will also stand a great deal more rain than red clover. Red clover is almost worthless after a few heavy rains, that is after it is dry.

The successful growing of alfalfa is only another branch of farming which stimulates and helps to keep up the high price on our land, and enables the farmer to farm it on such high priced land.

Without the aid of new and better crops and better blood in our live stock, the farmer would not be able to farm it on such high priced land as at the present time.

Now I would recommend any farmer to sow one-eighth of his farm to alfalfa.

If you would drive from Jefferson to Fort Atkinson, a distance of six miles, you would see growing successfully over 100 acres of alfalfa and most of these farms could not be purchased for \$150 per acre.

DISCUSSION.

Question: Do you use hay caps in making your alfalfa hay?

Mr. Widmann: I do not use hay caps. I put up twenty acres last year without any, and I have got hay just as green as can be and lots of it.

Mr. Lobdell: How about pasturing alfalfa?

Mr. Widmann: No, you must not pasture it; it won't stand pasturing in Wisconsin.

Mr. Lobdell: That is my experience, it kills it out to pasture it. How long will it last if you do not pasture it?

Mr. Widmann: I estimate on that field of alfalfa about six years. It will last longer, but after six years the June grass gets into it and I plow it up.

A Member: If it is not cropped too closely, will it bear pasturing?

Mr. Widmann: No, not at all.

A Member: I have been pasturing some three years and it isn't gone yet.

Mr. Goodrich: Don't let anybody fool you by saying that you can pasture alfalfa. You can't do it and expect it to live.

Ex-Gov. Hoard: If a man wants clear, sober reasoning as to experience with alfalfa, he can have it and he will see why he should not pasture it. The crown is exceedingly sensitive to

pressure, and when you cut the first crop and haul it over your field, I can show you distinctly the wheel marks on the second crop all over your field. That ought to be proof to you. The difficulty with men is that they do not observe enough. You pasture alfalfa and the heavy pressure hurts the crown, and by and by your alfalfa commences to fail.

Mr. Crouch: How about when you run a disk harrow over it?

Ex-Gov. Hoard: That doesn't run over it, it splits it. I never have tried it in this state, and Wisconsin conditions and climate make me a little cautious. I am going as fast as I know and can learn from a Wisconsin standpoint. Your horse traveling over your field with the disk leaves simply the mark of the pressure of your horse. The disk splits it, not separating it.

A. Member: You had a piece of alfalfa right out by your barn and half of it was very good and half was not. What was the matter with it?

Ex-Gov. Hoard: I had an eight-acre piece of alfalfa from which I took three crops. I left the fourth crop, knowing of course that I must not cut the fourth crop. I was away from home and my foreman hated to see that fourth crop wasted, as he thought, go back onto the ground, and it was the 25th of September. He thought it would run a ton and a half to the acre, and so he went on it and went to cutting it, and I came home about the time he had about five acres out of the eight cut. There was a square chunk in the center, about three acres, and I was shocked when I saw what he had done. I said, "August, you have ruined this alfalfa." But he says, "It will grow enough to shield it, to shelter it for the winter." "No, it won't, things don't grow much after the 25th of September, but we will know more about it next spring," I said. "You will leave that square chunk in the center," and he did so, hauled in the hay. I went off, was away several months of the winter, and I kept writing to August and asking about that field, and he would say, "I think it is all right." I came back and when the spring opened,—and here comes in the reasoning on this thing—I had had no experience before, I had only reasoned from what I knew of the biology of the plant, but here was the experience—when the spring opened, you could pull two thirds of those

crowns right out, they were rotten, while there stood that square chunk in the center which had not been cut, as strong and rampant as could be, and on that center piece, three acres, I cut about six tons to the acre, while outside of that was dead, we had to plow it up. Now, do see the meaning of these things? Several men about me who have cut a fourth crop in that section have suffered by it. A German there in Oakland had four acres, as beautiful a stand as I ever saw; there came a very severe drought in 1901 and that stood up beautifully, spring seeding. He was tempted and he went and turned his cattle on that new seeding.

Mr. Goodrich: I tried to drive him off of it.

Ex-Gov. Hoard: Yes, that is right. Well, you know the next spring he had no alfalfa; he ate it down and trod it down, and he said, when I remonstrated with him, he said, "What does a newspaper man know about farming?" The farmers about there are interested in this thing, one will say, "Why don't you grow alfalfa? Hoard grows alfalfa, you ought to know as much as a newspaper man about farming." "Oh, but that is a humbug," he says, and so this farmer that I remonstrated with, thought it was humbug, but he lost his alfalfa. Now, from thirty-five acres of land last year I put one hundred and eighty tons of alfalfa into my barn, that my brother Rietbrock tried to coax out of me at \$12 a ton. I produced two large silos full of good fodder on twenty-five acres of ground, about 250 or 275 tons; on thirty-five acres, 180 tons of beautiful hay, as good as bran, nearly, in its feeding value. Do you see how I could economically carry on that farm, a lot of stock and make money out of it, when I could produce the entire subsistence necessary for that stock in alfalfa hay and corn ensilage, and do you see how much of the farm I could turn out to pasture and how little would be required to be bought for their sustenance in the winter? John Widmann is a good farmer and he has given you good gospel. He lately sold to a Mexican man twenty-six head of pure bred Holsteins and grades for \$2,500.

Mr. Widmann: Twenty-six hundred dollars, Governor.

Ex-Gov. Hoard: I am glad to be a little under, John.

A Member: How did your alfalfa keep in the silo?

Ex-Gov. Hoard: I didn't put it in the silo. I said I had corn ensilage for my silo. On twenty-five acres of ground, I

filled two silos and on thirty-five acres of ground I filled a lot of barn room with alfalfa hay. I never have tried putting hay into the silo. I do not grow any other hay but alfalfa hay.

Mr. Garrett: Don't you think if you had top dressed that fourth crop that was cut off, it would have done better?

Ex-Gov. Hoard: That won't do it. You cut alfalfa after the 25th of September, and it bleeds badly and the crown does not set for the ensuing crop, and if the crown does not set on the alfalfa roots—the buds set, I mean, in the ground, then it seems to sicken and dwindle away, it fails; so that in cutting alfalfa we want to get on it early just when there is the first indication of blossom, when the buds have set in the ground for the next growth. If you cut it too late, after it has blossomed, you will have a spindling growth.

Mr. Coburn: I want to call your attention to this sample of alfalfa that is here. That is a very good specimen of alfalfa, strictly prime. It might be a little greener, but it is a very good color. That was grown on Kansas upland about as poor as we have, and the man cut it three times this year, realizing four tons per acre. I took it out of a barn in the neighborhood to bring here as what the Professor would call a concrete illustration. Now, before parting company with you I want to suggest to you Wisconsin people to remind you how much you have been favored in this state by having in it such citizens as Hiram Smith and W. D. Hoard, General Burchard and Mr. Goodrich here, and others that I might name and should name, who have been the cause of bringing to your state millions and millions of dollars, great prosperity and great eminence. You are known everywhere for what you have done in the cattle line, dairy cattle particularly, and this has largely been incited by the example and the words of these few men, and I want to testify here as a man from an outside state that this fact is recognized everywhere and you ought to build these men a monument, up there at Madison, sometime, five hundred feet high—don't overlook it. It is almost impossible for you to realize how greatly you have been favored, by and through these men. I might add that Kansas has sent up here one of her boys to help Dean Henry. Professor Otis is one of our boys and he knows all about alfalfa. I hope you will get up next to Dan, because he is worthy of your most kindly consideration. You will see his name in the

papers from now on, Professor D. H. Otis, from Madison, and I commend him to your consideration. He is pure gold, he is all right, and I am glad we can contribute such men to Wisconsin and her prosperity.

Mr. Clinton: I am asked to extend the thanks of the ladies of the Congregational Church for the generous donation of prize butter by Mr. Rietbrock, and also of the cheese by this Association. You will get a taste of both the butter and cheese at the banquet tonight.

Adjourned to meet at 10 o'clock the next morning.

MORNING SESSION, FRIDAY, FEBRUARY 2, 1906.

The Convention met pursuant to adjournment at 10 A. M.
The President in the chair.

The report of the Finance Committee was submitted to the convention by Mr. Glover, and received.

Waukesha, Wis., Feb. 1, 1906.

We, the committee appointed to examine the books of Secretary and Treasurer, beg to report that we have examined said books and vouchers and find them to be correct and accord with the report of the secretary to the convention and now on file in secretary's office.

Auditing Committee

H. C. TAYLOR,
CHARLES LINSE,
A. J. GLOVER.

The Secretary read the following letter from Stephen Faville, one of the ex-presidents of the Association:

Madison, January 26, 1906.

Col. Burchard:

Yours containing notice of the time and place of meeting of the *Old Class* received. I can think of nothing that would give me more pleasure than to meet my former comrades and laborers in Dairy Vineyard, for believe me I have the same feelings for them that you say they have for me. But my sight is so much gone that it would not be at all prudent for me to go away from home alone, so I shall have to content myself at home and imagine the good time you are having and the wise and helpful things that are being said. Tell the *Old Boys and Girls* (for me) that I have not lost an iota of my faith in the *Dairy Cow*, but that she will more and more (as we come to trust her more intelligently) help to bear the financial burdens that are sure to press upon the coming generations. Now, that my work day is over it is one of my pleasant memories, the small part I took in starting an industry that has proved so potent a factor in the struggle to keep the "wolf from the door."

I tell you boys we builded better than we knew. Who would have dared to predict that in a little more than a quarter of a century the business we started and fostered would become one of the leading industries of the state. But so it is and my word of cheer is let the good work go on.

Now, Col., I can't see a word that I have written, so if I have written anything that I ought not to you can strike it out and if I have omitted anything you can supply the omission. With the most kindly greetings for the whole convention and wishing that you may have a pleasant and profitable meeting, I am your brother dairyman,

STEPHEN FAVILLE.

Mr. Emery: I occasionally meet on the streets of Madison our old friend, Mr. Faville, and always when I meet him I am impressed that he carries with his eighty years the enthusiasm of youth. He always speaks to me about this association and the work of dairying with enthusiasm and interest and has kept up

a progressive spirit. He is not living in the spirit of eighty years ago, but in the spirit of the present; he is learning how to grow old wisely.

On motion of Mr. Philips, duly seconded, the secretary was instructed to send to Mr. Faville a message of love and greeting.

WORK OF THE WISCONSIN DAIRY AND FOOD COMMISSION.

J. Q. Emery, Dairy and Food Commissioner.

Delivered before the Wisconsin Dairymen's Association at Waukesha, February 2, 1906.

In the time given to me, I have not time to recognize, as I would like to do, the influence of the various organizations in the formation of this commission. The dairy interest of this state has been forcible. I recognize that this association, the Butter Makers' Association, the Cheese Makers' Association and the Dairy School, have been very powerful in benefiting these great dairy interests, and it has been the constant effort upon the part of the present commissioner to keep the Dairy and Food Commission at work in its own legitimate lines of work. The spirit of harmony and co-operation which has prevailed in each one of these agencies, the trying to uplift the cause in its own legitimate field of work and thereby produce the most effective co-operation, have been mighty forces in this state in the past, and particularly in this association because it has had a few able, competent, disinterested men who have worked unselfishly for the life of the dairy interests of the state. So long as that spirit prevails, no jealousy or bickering shall enter in to divert our efforts from the cause to ourselves.

I have, with much interest, studied the thirty-three annual reports of the Wisconsin Dairymen's Association. More and more as I have studied these reports am I impressed with the many important achievements in this state, which have had their initiative in the Wisconsin Dairymen's Association. The in-

initiative for the establishment of the Wisconsin Dairy and Food Commission was taken by this association.

In the year 1887, at the fifteenth annual meeting, held at Sparta, President W. H. Morrison called the attention of the association to the need of such a commission and recommended that steps be taken to secure such a result. The following resolution was adopted at that session, which though somewhat mild looked toward the establishment of such a commission:

Resolved, That this association ask of the legislature a law with proper police authority, to prevent the manufacture and sale of any form of adulterated cheese, for the pure article. That any adulterated cheese shall be branded and sold for what it is. That any violation of this law shall incur a penalty of not less than \$100 for the first offense. There must be a suppression of the practice of adulteration of cheese or the cheese industry of Wisconsin will suffer almost irreparable loss.

In 1888, at the sixteenth annual session, held in Ripon, President H. C. Adams, in his annual address vigorously advocated the establishment by the state of a Dairy and Food Commission. At that meeting the association adopted the following resolutions:

“Resolved, That in the opinion of this association, the time has arrived in the history of the state for the passage of a law similar to that in existence in Minnesota, Ohio, New York and other states, and the providing for a dairy commission, whose duty it shall be to ferret out and prosecute all adulterations of butter and cheese, and the sale of the same, as well as other foods, and we respectfully ask the next legislature to enact such a law and establish such a dairy commission.

Again, at the seventeenth annual session, held at Augusta, in 1889, President Adams in his annual address, at greater length and with greater vigor, advocated the establishment in Wisconsin of such a commission. At that session the association adopted the following preamble and resolution:

“Whereas, Imitations of butter are being sold in Wisconsin in violation of laws, to the prejudice of honest goods. Cheese is being made in large quantities, robbed of its

natural fat, filled with lard or other foreign fats, and not stamped as the law provides. Adulterated and impure milk floods the market of towns and cities, drugs are made useless, drinks made more poisonous, and nearly every article of human food diminished in value by adulteration; therefore,

Resolved, By the Dairymen's Association, that as dairymen and citizens we hereby earnestly express to the state legislature our unanimous request for the passage of bill No. 444, A., providing for the establishing the office of food and dairy commissioner, and for the execution of all laws aimed at adulteration."

It is both interesting and significant to remember in this connection that the father of this association, Honorable W. D. Hoard, was governor of Wisconsin in 1889.

By Chapter 452 of the laws of 1889, the office of Dairy and Food Commissioner for the state of Wisconsin was created, and he was authorized to appoint two assistants, one to be an expert in the matter of dairy products and the other to be a practical analytical chemist. These three comprised the commission until the year 1895.

The following are the duties of the commissioner, then prescribed which, with slight amendments, remain at the present time:

"It shall be the duty of the commissioner to enforce all laws that now exist, or that may hereafter be enacted in this state, regarding the production, manufacture or sale of dairy products, or the adulteration of any article of food or drink or of any drug; and personally or by his assistants to inspect any article of milk, butter, cheese, lard, syrup, coffee or tea, or other article of food or drink or drug, made or offered for sale within this state which he may suspect or have reason to believe to be impure, unhealthful, adulterated, or counterfeit, and to prosecute, or cause to be prosecuted, any person or persons, firm or firms, corporation or corporations, engaged in the manufacture or sale of any adulterated or counterfeit article or articles of food or drink or drug, contrary to the laws of this state.

Said commissioner or any assistant shall have power in

the performance of his official duties to enter into any creamery, factory, store, salesroom or other place or building where he has reason to believe that any food or drink or drug is made, prepared, sold or offered for sale, and to open any cask, tub, package or receptacle of any kind containing, or supposed to contain, any such article, and to examine or cause to be examined and analyzed the contents thereof.

The first commissioner was the Honorable H. C. Thom, who was appointed by Governor Hoard, May 29th, 1889. The first chemist was Professor F. G. Short and the first assistant commissioner was Mr. H. K. Loomis. Mr. Thom was succeeded by Mr. D. L. Harkness; Mr. Loomis was succeeded by Mr. Walter A. West, and Professor Short was succeeded by Mr. George C. Cox. Mr. Harkness died in 1894 and was succeeded as commissioner by Thomas Luchsinger.

In February, 1895, Honorable H. C. Adams was appointed commissioner. Mr. W. W. Chadwick was appointed assistant commissioner, and after serving a two year's term was succeeded by C. W. Sweeting. A. S. Mitchell was appointed chemist.

The legislature of 1895 added a stenographer and confidential clerk, also a dairy inspector to the commission, the latter at \$3.00 per day and expenses; Norton J. Field was appointed as such inspector. These were the only additions to the corps of the commission from its establishment in 1889 until the year 1903. The limitations of this paper preclude a presentation of the work of these several administrations, farther than to say, that during Mr. Adams' term of office the laws relating to the sale of oleomargarine were amended and greatly strengthened and were enforced; laws prohibiting the manufacture and sale of filled cheese were enacted and enforced, which with the United States tax on filled cheese practically wiped out the filled cheese iniquity from the state; laws regulating the sale of renovated butter were also enacted and enforced, and in 1897 the first general law defining the adulteration of food was enacted.

Hon. H. C. Adams resigned as commissioner May 1, 1902, having served a little more than eight years in that capacity. He was succeeded December 24, 1902, by the present incumbent. Mr. Mitchell voluntarily resigned the position of chemist, December 31, 1902, and was succeeded by Dr. Richard Fischer, the

present incumbent. The office of assistant commissioner having become vacant in the fall of 1903, Mr. U. S. Baer, the present incumbent, was appointed to that position. January, 1904, Mr. F. E. Carswell was appointed successor to N. J. Field, as dairy inspector. Mr. F. M. Buzzell was appointed food inspector, Mr. J. G. Moore, creamery inspector and Mr. Bjorne Lovdal, assistant chemist, under authority of the law passed by the legislature of 1903.

As a result of persistent public agitation and effort with the legislature a law was passed in 1905 which added to the commission an assistant commissioner at a salary of \$1,600 a year; an assistant chemist at \$1,200 a year; a chief food inspector at \$1,200 a year; 4 cheese factory, dairy and food inspectors at \$100 a month, and 3 creamery, dairy and food inspectors at \$1,200 a year. The complete organization of the commission since the legislature of 1905 has been but recently completed and the personnel of the commission is now as follows:

J. Q. Emery, Dairy and Food Commissioner.

Richard Fischer, Ph. D., Chemist.

U. S. Baer, Assistant Commissioner, Dairy Expert.

J. G. Moore, Second Assistant Commissioner, Creamery Expert.

F. M. Buzzell, Chief Food Inspector.

Ethel D. Thomas, Stenographer and Confidential Clerk.

A. E. Kundert, Assistant Chemist.

F. W. Tweeden, Assistant Chemist.

F. E. Carswell, Cheese Factory, Dairy and Food Inspector.

E. L. Aderhold, Cheese Factory, Dairy and Food Inspector.

J. D. Cannon, Cheese Factory, Dairy and Food Inspector.

Fred Marty, Swiss Cheese Factory, Dairy and Food Inspector.

Thomas Corneliuson, Creamery, Dairy and Food Inspector.

H. C. Larson, Creamery, Dairy and Food Inspector.

P. A. Larson, Creamery, Dairy and Food Inspector.

Will McAdam, Creamery, Dairy and Food Inspector.

James Van Duser, Creamery, Dairy and Food Inspector.

W. F. Scott, Food Inspector.

This brief sketch of the origin, development and personnel of the commission is given as a matter of interest to this organization, which has been so instrumental in its establishment and

growth. Of the eleven men who are assistants and inspectors, eight are either graduates of our dairy school or have been instructors in that school, and four of them have been employed by the Wisconsin Dairymen's Association as traveling instructors. The law of 1905, which added ten to the commission, expressly provides that the appointees shall be experts in the special lines of work required of them.

Published reports of the commission show the work of the commission relating to creameries and cheese factories, to have been limited to emergency wants made upon the commission for testing the milk of patrons as to butter fat content, skimming and watering. The number comprising the commission was so small that no other systematic work for improving the conditions of creameries and cheese factories seemed possible. This work of milk inspection, however, with the prosecutions that were made for violations of the law, has, without doubt, had a marked effect in improving the quality of milk offered at creameries and cheese factories in so far as the butter fat content is concerned, and the work done of inspecting city dairies has also had the effect to improve the quality of city milks. With the largely increased force of the commission, provided during the past three years, more work and of different character has been possible.

Between the 4th day of July and Christmas all of the 1604 cheese factories, 971 creameries and 271 skimming stations, making a total of 2856 were inspected. The purpose of this inspection was to acquaint the managers and makers with the laws relating to the sanitary conditions required of cheese factories, creameries and skimming stations, and of legal qualities of milk for manufacturing into the food products of cheese or butter. It was thought wise and proper, before commencing a vigorous campaign, having for its object the improvement of the quality of milk offered by patrons of cheese factories and creameries, to see to it, first, that the cheese factories and creameries and their surroundings were in a clean and sanitary condition. It would seem not only unwise but unjust to undertake to compel patrons to furnish clean and lawful milk to a cheese factory or creamery that was itself in an unclean and unsanitary condition. The instructions given to assistants and inspectors were that when cheese factories or creameries were found in an unclean

or unsanitary condition to state to the management the provisions of law relating to the same and give a reasonable time in which to put the factory into a clean and sanitary condition. That inspection was to be followed by a second inspection after a reasonable time, and if there has been no reasonable effort at compliance with previous warning, then to bring prosecution for violation of law. As a result about 30 prosecutions were made within the time specified, and with two exceptions conviction secured. In most cases the party plead guilty and paid the minimum fine of \$25 and costs. There can be no doubt that the report of these prosecutions by the press of the state had a stimulating effect upon the managers of cheese factories and creameries generally throughout the state, and that in consequence there has been a thorough-going cleaning up of factories and creameries. This has been noticeable by buyers of our dairy products, who have visited these places, and by insurance agents, who are carrying policies on these factories. They have commented in most favorable terms upon the results of these inspections.

Having completed the inspection of all these cheese factories and creameries, two members of the force have been detailed to attend the farmers institutes during the winter and give instruction on the subject of lawful milk. These men were instructed to make their teaching concrete. They were instructed to use curds prepared by using the Wisconsin curd test to show the effect upon clean and improper methods in the handling of milk. They were instructed to use filtrates, showing the filth taken from milk actually offered at creameries and cheese factories. They were instructed to contrast by means of pictures the difference between a clean and a filthy cow and in general to instruct on the suitable care of the herd and of the milk and utensils for the production of a lawful milk.

Four men have been detailed for the winter to make an inspection of city milks. This includes a test for the butter fat content, skimming or watering, and also the use of the Wisconsin curd test to determine the qualities of milk, as to cleanliness and proper care. These inspections are followed up by inspections of the premises, utensils on the farms, barns and herds of producers of these city milks.

One man has been detailed to devote his time to the enforcement of the law relating to the sale of oleomargarine, and another man has been detailed to enforce the law, requiring that cans that are used in shipping milk to cities by railway or steam boat lines must be thoroughly cleansed before returning to patrons.

Another feature of the work of the commission inaugurated within the past few years is the publishing of a quarterly or a semi-annual bulletin, which contains the results of inspections of cheese factories and creameries. The actual conditions as found at these factories and creameries have been reported. The factory and its surroundings that have been kept in a clean and sanitary condition have been so reported; where factories have been unclean and unsanitary those facts have not been concealed. That these bulletins containing these reports have been of a character tending to stimulate improvement, I think admits of no question. These bulletins also contain the reports of analyses of foods suspected of being adulterated that have been made by the chemist of the commission. Publicity is thus given to unlawful adulterations and as these bulletins have been sent not only to every creamery and cheese factory in the state, but to all of the dealers in foods, they have been educational in that they guard against unlawful products by furnishing to dealers means of knowing the true character of such products. More and more as time has passed, dealers have come to value these bulletins and to consult them as to the revelations they make concerning food products.

I desire now to call attention to a line of work that so far as it has been possible has been done during the past two years and which will be resumed in the early spring to as full an extent as we are able in the matter of creamery and cheese factory inspection. The inspector goes to the creamery or cheese factory for the purpose of improving the conditions there. His mission must not be to promote self-satisfaction with existing conditions. The ever present spirit and purpose must be that of progress. We can justify the employment and payment of these inspectors only for the purpose of improving existing conditions. Besides a small case for taking milk samples from patrons, each inspector is provided with a case containing the very best imple-

ments or supplies that are required for him to do up-to-date work in a cheese factory or creamery. The inspector goes to the creamery or cheese factory to examine carefully and inquire into every condition present in that creamery or cheese factory and to ascertain what is right and what needs improvement. This he does in the presence of the maker and thereby many times raises the standard in the quality of the maker's work. The inspector goes to the creamery or cheese factory early in the morning. He procures a list of the names of the patrons. He has bottles ready for taking a sample of each patron's milk as delivered. He examines the scales to ascertain if they are accurately balanced or are so set as to cheat the patron out of a few pounds of milk each morning, and lay the foundation for the report of a large overrun, for not only does inaccurate weighing defraud the patron but makes a false report and impression as to the amount of overrun and the price paid per pound for butter fat. The kind of competition thus engendered is fraudulent and destructive of the best interests of the creamery and cheese factory industry.

The inspector stands by the weigh cans and inspects the work of the man who receives the milk, as well as the milk and cans of the patron. He scrutinizes the method of taking the samples of milk for testing and how the composite samples are cared for. He observes carefully whether or not the man who is taking in the milk receives any unclean, unsuitable or unlawful milk, and if unclean, unlawful or otherwise unsuitable milk is offered by the patron and received by the creamery man he warns both alike concerning the unlawful and unwise practice. At times he instructs the patron as to the proper way to wash and care for his cans and the proper method of caring for milk. He shows him how the quality of the product and therefore the price and hence the profits to the patron are ultimately dependent upon the clean and wholesome character of the milk furnished by the patron. He discloses to the patron how these bad milks affect the flavors of the dairy products in quality and value and how some rations fed to the herd at improper times or in unsuitable quantities may injuriously affect the entire output of the factory, thus imposing a loss upon all the patrons.

He requests the patrons to meet at the factory late in the

afternoon or early evening. With the samples taken he then proceeds to make the Babcock test for fat, the lactometer test for watering or skimming, and a Wisconsin curd test to determine the character of the milk of each patron as to its cleanliness or the kind of care it has received. When the patrons meet him later in the day he makes known to them the per cent of milk fat found in each patron's milk. If he has reason to suspect watering or skimming of milk by any patron he furnishes a sample to the state chemist for more detailed analysis. He exhibits to them the samples as shown by the Wisconsin curd test, which is an actual and accurate demonstration of the character of each patron's milk. Here they see from one patron's milk a curd that is of a fine velvety, firm texture, having a clean agreeable flavor. This demonstrates that the patron's milk from which this curd was formed was produced under clean conditions, quickly cooled and otherwise properly cared for. He exhibits the curd from another patron's milk that has in it gas holes or pin holes so-called. This has a tainted flavor. This peculiar texture and flavor are due to gas forming bacteria. They thrive in uncleanness of some sort. He shows them a curd from another patron's milk that is spongy in texture and has a very offensive flavor or odor. He explains to them that this is due to conditions worse than those from which number two resulted. He explains to them that it is impossible to make the best quality of butter or cheese from such milk and further explains to them the great loss that is being sustained by the butter or cheese factories due to bad milk. He lets them see the curds produced from each patron's milk that each may see and know for himself that there was a difference in the quality of milk furnished by the different patrons both as to fat content and cleanliness. He explains to them how the good milk and the bad milk are each produced and warns them against the supplying of bad milk as being wrong and unlawful and liable to lead to prosecution if continued.

Having taken samples of the milk from the last gallon or two of the patron's milk as it was delivered from the cans and having passed that milk through filtrates of absorbent cotton or through filter papers, he exhibits to them the actual filth, if any, thus taken from their milk on the morning of his inspection.

He illustrates and explains the use and reliability of the Babcock test when skilfully used. He explains the requisite conditions for securing accuracy by that test. He has instruments and uses them to test the pipettes to see if they are absolutely correct as to size. He tests the calibration of the bottles to determine their accuracy and inaccuracy. He applies his speed tester to the Babcock test to ascertain if the operator is running it at the rate of speed to give accurate results. He tests the sulphuric acid to find if it is of the correct strength. He ascertains at what temperature the operator reads the test and if he measures the fat column from the lowest point at the bottom to the extreme top limit of the meniscus as he should. He tests the skim milk, butter milk and whey for butter fat content. He ascertains if the weights used for weighing the cream in testing are accurate. He examines the weigh-cans, pipes, pumps, churns, vats, vat gates and everything connected with the factory to ascertain if they are kept clean, and he does the same as to the floors and walls as well as the surroundings. In his inspection of the surroundings he gives particular attention to the drainage, and where that is defective he suggests means for securing adequate drainage. If conditions are found bad or unlawful he warns the maker or manager that they must be changed within reasonable time or prosecution must necessarily follow, and he prosecutes if the change is not made.

The curd test gives him a cue as to what patrons need his inspection, and so he goes to the premises of the patrons who furnish the worst milks and he points out to them the changes to be made. If he finds the milk at the factory below the legal standard of butter fat or otherwise unlawful, he visits the farm and takes samples there for testing. The discrepancy, if any, between the tests of the milk at the factory and that at the farm determines the course to be pursued.

I have dwelt upon the work of the commission along dairy lines because that is of special interest to dairymen; but dairymen as citizens are also interested in the work of the commission as it relates to food adulteration. The limitations of time, however, permit only the briefest reference to this work. A conservative estimate places the annual cost to the people of this country for adulterated food products at four hundred million

dollars; that does not mean that there is no value whatever in many of these adulterated foods, but the price at which they are sold is greatly in excess of their actual value and the price they would bring if sold in the market for what they actually are. Immense fortunes have been built up by the difference.

There are more than 6,000 groceries or general stores in this state where foods are sold; 2,000 meat markets, and nearly 1,000 drug stores, not to mention the numerous places where drinks in the form of beverages are dispensed.

There are now two food inspectors constantly in the field, aided incidentally by the other inspectors, and three chemists in our laboratory kept constantly busy analyzing foods suspected of adulterations. Let me briefly state the character of some of the adulterations we have found in our experience during the past three years.

Buckwheat Flour: Low grade wheat, rye and corn flour. Also gypsum.

Chocolate and Cocoa: Containing starch and oxide of iron.

Candies: Paraffin and clay.

Catsup: Artificial color, chemical preservatives, tomato refuse (skin and seed).

Apple Cider: Adulterated by addition of preservatives (salicylic acid and hydrofluoric acid). Often diluted with water or with sugar water. Sometimes contains no apple juice but is made from sugar, water, tartaric acid, artificial flavor and coal tar dye.

Raspberry and Orange Cider and Rootbeer: Made from sugar, water, tartaric acid, saccharin, salicylic acid and coal tar dyes.

Soda Water: Often contains saccharin, salicylic acid, coal tar dye.

Cream: Boric acid, formaldehyde, gelatine, artificial coloring matter, deficiency in fat.

Evaporated and Condensed Cream: Containing only 7.9% milk fat.

Cream of Tartar: Composed of calcium acid phosphate, calcium sulphate, alum and starch.

Grape Juice: Sugar, water, tartaric acid and coal tar dye.

Currant, Strawberry and Raspberry Jellies: Made from apple pomace, starch paste, gelatin, glucose, artificial flavor, tartaric acid and coal tar dye.

Jams and Preserves: Made from under ripe or decayed fruit, from fruit refuse, apple pomace, glucose and coal tar dye.

Lard: Cottonseed oil and beef 'stearin, beef tallow.

Lemon Extract: Wood alcohol, terpeneless lemon oil, robbed oil of lemon, oil of lemon grass.

Vanilla Extract: Wood alcohol, vanillin, coumarin, prune juice, caramel, coal tar dye.

Cider Vinegar: Spirit vinegar with artificial coloring matter, sugar, glucose or apple pomace.

Malt Vinegar Spirit vinegar with artificial coloring matter, sugar or glucose.

Wine Vinegar: Spirit Vinegar.

Spirit Vinegar: Pyroligneous acid.

Maple Syrup: Mixed with glucose, cane syrup or sorghum, or made entirely from sugar and a decoction of maple wood, hickory wood or corn cobs.

Maple Sugar: Made by the evaporation of the above.

Meats, Chopped Meats and Sausages: Colored with coal tar dye and preserved with sulphites and boric acid or borax.

Milk: Formaldehyde, boric acid, borax, added water, skimming, artificial color.

Molasses: Glucose, poisonous salts introduced in the refining of sugar.

Sorghum: Glucose.

Syrup: Glucose.

Olive Oil: Cottonseed oil and peanut oil.

Pepper: Pepper dust, pepper hulls, cocoanut shells, olive pits, roasted cereals.

Cayenne Pepper: Oxide of iron.

Wine: Sugar, water, tartaric acid, tannin, coal tar dye.

The increase in the number of inspectors and in the number of chemists for the commission during the past three years has made it possible to greatly extend the work in restraining the sale of adulterated foods. This, with the awakened interest of the people throughout the state, occasioned by the exhibit on adulterated foods at the State and several County Fairs, and the

making of that exhibit at more than a score of different cities throughout the state, accompanied with an address upon the subject of Food Adulteration, has resulted in producing such anxiety upon the part of manufacturers, jobbers and dealers in foods that for the past three months a small army of traveling representatives of manufacturing and jobbing firms have traveled this state in a lively manner, removing unlawful foods from the shelves of dealers and in many instances from the state, and relabeling others so as to make them comply with our law.

The question "what shall we do to be saved" seems to have become one of vital interest. Within the past six months more than fifty meat dealers have been prosecuted and convicted for selling chopped meat or sausage containing chemical preservative or artificial coloring in violation of law, and the prosecutions of dealers in other varieties of foods have impressed upon the minds of dealers that there is a law which must be obeyed. Time fails me to tell of the specific laws recently enacted or amended relating to adulterated milk or adulterated cream; canned goods; vinegar; prohibiting the use of artificial coloring and antiseptics in chopped meats and sausages; relating to chemical preservatives in foods; relating to maple syrup and maple sugar; glucose mixtures; buckwheat flour; condensed milk and evaporated cream; lemon extract and vanilla extract and others. These laws have greatly strengthened the food laws of the state and their enforcement must result in greatly improved conditions.

The question of pure food is one that should interest every citizen of this commonwealth. The extent to which food adulteration has been carried almost passes belief. To solve the problem of pure foods is a stupendous task and will require Herculean efforts by the American people. It is a problem that must be solved. That it will ultimately be solved and solved right my confidence in the American people does not allow me to doubt.

(At close of paper): I wish Mr. Baer would add to what I have said, the comment that he heard about the Canadian meeting by a certain party.

Mr. Baer: Mr. Chairman, a certain traveling man told me, at Oconomowoc last week, that he attended the meeting of the

Eastern Canadian Dairymen, of which Association Mr. Albert Johnson is president, and Mr. Johnson had attended the annual meeting of the Wisconsin Cheese Makers in Milwaukee in January and he went back and told the people in Canada what Wisconsin was doing, what the Wisconsin Dairy and Food Commission was doing for the great dairy interests of the state, and he said this to those people. "We must wake up. We must follow suit. The markets of the world that are handling our goods and the export market are hearing all this, and I have been to Wisconsin and bought a large quantity of cheese there in Richland county for our fancy trade, and I found the goods all right, I found the factories clean over there," and he said, "Gentlemen, it is high time that we were getting busy over here, or Wisconsin will take our cheese markets away from us."

The report of the Committee on Nominations being called for, the report was made by Governor Hoard as follows:

Your committee beg leave to report the following names for officers of this Association for the ensuing year, agreeably to your instructions:

For President, W. J. Gillett of Rosendale.

For Secretary, General G. W. Burchard, who has so long and faithfully served us, and who has not yet proven his inefficiency on account of age.

For Treasurer, H. K. Loomis, who has for over twenty years faithfully carried the funds of the Society and has done yeoman's work in the representation of this Association and the interests of the state at great expositions.

The report of the Committee as made by Governor Hoard was unanimously adopted on motion of Mr. Moore, duly seconded.

The Committee on Resolutions submitted the following report and the same was approved and adopted.

RESOLUTIONS ADOPTED BY THE WISCONSIN DAIRYMEN'S CONVENTION AT WAUKESHA, FEBRUARY 2, 1906.

Resolved, That this Association, realizing that the utmost freedom of inter-state commerce is the life and soul of the dairy industry of the entire country whereby we can reach both domestic and foreign consumers with reasonable despatch and cost, do hereby endorse President Roosevelt in his struggle to enlarge the powers of the Inter-State Commerce Commission and we urge upon our members of Congress their support of the Hepburn rate bill now before that body. The Secretary is hereby instructed to forward to our members of congress copies of this resolution.

Resolved, That the Wisconsin State Dairymen's Association, appreciating the great work which has been done by the Agricultural Experiment Stations of the United States in the development of better farm knowledge, and realizing that these stations have received no additions to the income from the federal government since the original act was passed in 1887 which provided for them; and realizing further that the constant extension of their work requires additional funds.

We do hereby express our hearty approval of Bill H. R. No. 345, introduced by Representative Adams of Wisconsin, which provides for a gradual increase of appropriations to these stations for five years until the final increase shall double the present appropriation to each station: and

Resolved, That a copy of these resolutions be sent to each of the Senators and Representatives in Congress from this state.

Resolved, That this Convention recommends that the Association inaugurate at the earliest practicable time one or more "testing associations" rendering such aid thereto as may be necessary to insure their successful operation.

Resolved, That the National Dairy Union of which Mr. S. B. Shilling is President and Chas. Y. Knight is Secretary, by its record of achievement in the past, and its vigilance and efficiency in looking after the interests of the dairy farmers and the manufacturers of dairy products, thereby thwarting the unlawful and anarchistic schemes of oleo manufacturers and dealers, has

richly earned our gratitude and is entitled to our continued confidence and support.

Resolved, That this Association, representing the dairymen of Wisconsin, most heartily commends the legislature of 1906 for the laws enacted, materially increasing the staff and thereby the efficiency of the state Dairy and Food Commission.

Resolved, That it is a source of sincere gratification to us, for which we are devoutly grateful to Almighty God, that we are permitted to have with us in this convention Hon. W. D. Hoard, one of the founders of the Association, its first secretary and at one time President, and with a single exception present at its every consecutive annual meeting, of which this is the thirty-fourth. The indebtedness of this Association and the dairy farmers of Wisconsin and of the United States to Mr. Hoard is beyond computation in figures, or expression in words. We pray that there may be vouchsafed to him many more happy years of life and usefulness among us.

Resolved, That we regret that the infirmities of age prevent the attendance at this meeting of the other survivors, Messrs. Stephen Favill and H. C. Drake, of that small group of earnest dairymen who assisted in the organization of this Association at Watertown, February 15, 1872. We tender them the assurance of our continued and profound respect.

Resolved, That we congratulate Prof. W. A. Henry, Dean of the Agricultural College of Wisconsin, upon the completion of a quarter of a century's labor with this Association, and we tender to him the assurance that its members have had no occasion to regret or withdraw the welcome extended to him at our convention in Waukesha twenty-five years ago.

Resolved, That the dairymen of Wisconsin are unalterably opposed to the bill, recently introduced in Congress by Representative Grovesnor of Ohio, reducing the tax upon oleomargarine colored in imitation of butter, or any other modification of the laws now in force relating to oleomargarine and renovated butter whereby their efficiency in protecting the market and the consumer from fraud, deception and trickery shall be in any degree lessened. Experience has amply demonstrated that neither the manufacturers of, nor dealers in, these products have any reason to complain of the laws as they now stand, except that

they have rendered it increasingly difficult to dispose of their wares for what they are not.

Resolved, In view of the necessity of using every possible means to limit the spread of bovine tuberculosis in the state, and the importance of an early diagnosis, which can readily be established by the use of the tuberculin test, this association recommends to the dairymen of the state the widespread introduction of this test as the best means of determining the actual condition of herds.

Resolved, That it is the profound conviction of the Wisconsin Dairymen's Association that the time has come when the Dairy Division of the Department of Agriculture at Washington should be elevated to the dignity of a distinct Bureau in that department with funds sufficient to more adequately and worthily cover the great field of dairy industry. When we consider the magnitude of this great industry, second only in value of annual product to the corn crop, the reason for this desirable change will be apparant. We call upon the members of congress in both houses to use their influence to this end.

Resolved, That this association takes great pleasure in hereby expressing its appreciation of the efficient manner in which its officers, President Hill, Secretary Burchard and Treasurer Loomis have performed their duties during the time they have held their respective offices in the past.

According to the past custom President Hill, who has served in his official capacity for two years, is to be retired and the best we can hope for is that his successor will be equally efficient.

We also are thankful that Secretary Burchard has reconsidered his determination to retire, and consented to serve us, for at least the ensuing year, as our Secretary which office he has so ably filled for the past eight years.

Resolved, That this Association is deeply thankful to the citizens of the city of Waukesha for the cordial welcome and hospitality extended to us, making us their guests indeed. We are encouraged in a belief and faith that urges us to continue our efforts toward advancing the dairy interests of our state, by the intense interest shown by the farmers of this vicinity in the topics presented for consideration at this convention and the great degree of intelligence in dairy matters exhibited by them

signifies that seeds of dairy truth sown by this Association and other agencies has not fallen on barren soil in Waukesha county.

Further we resolve, That the memory of the elegant banquet tendered us Thursday evening by the citizens of this city will ever remain one of the pleasant recollections of our lives.

C. P. GOODRICH,
E. L. ADERHOLD,
FRED RIETBROCK.

The Chairman: It gives me great pleasure, indeed, to say to you that Professor W. A. Henry, Dean of our Agricultural College, is with us this morning. Twenty-five years ago, at the meeting of this Association at this place, Professor Henry made his first appearance before an audience of Wisconsin farmers. He is with us to-day, and I am sure you are pleased, as I am.

THE IMPORTANCE OF CO-OPERATION AMONG DAIRY FARMERS.

Prof. W. A. Henry, Madison.

Members of the Wisconsin State Dairymen's Association:— Twenty-five years ago I attended the ninth annual meeting of this Association in this beautiful city of Waukesha. I had been in the state but a few months and the impressions of that meeting are deep in my memory. Pardon me if I grow reminiscent.

Charles R. Beach, of Whitewater, a noble Roman in face and bearing, a philosopher in reason, and a first-class farmer in execution, gave us a scholarly address. His butter at that meeting scored 50 points out of a possible 50 points. How naturally it follows that a worthy son, trained in our Agricultural College, is today the honored head of the dairy department in one of the eastern agricultural colleges.

Hiram Smith, of Sheboygan Falls, was there,—stern, sturdy

in thought, rich in pungent expression. Here is a paragraph from the paper he read at that meeting:—"There are many farmers in our day more intent on planting in certain stages of the moon than they are in the pulverization of the soil; more confidence in certain breeds for milkers than they have in June-cut hay and ground feed; more faith in boring holes in the horns of sickly cows than in warm stables."

The leading attraction was X. A. Willard, the scholarly Empire State dairy authority of the last generation.

D. W. Curtis was secretary, as he was for many years thereafter. How we all loved Secretary Curtis, quiet, full of accomplishment, honest and frank to the core.

The editor of the Jefferson County Union, W. D. Hoard, was the life of the meeting. There was no Hoard's Dairyman in those days, but the greatest dairy editor the world has ever seen was in the process of evolution. Who can ever measure the worth of that one man to this commonwealth! Great as is our love and admiration, his worth falls far short of full recognition.

Those pioneers of the cheese industry, Stephen Favill, bright, earnest and pointed, and Chester Hazen, quiet and earnest, were wheel horses in their line.

Mrs. Kelley, God bless her! was there with her well sharpened pencils and rapid moving fingers, placing in permanent form, knowingly and wisely, what we said. How many grammatical errors and bungling sentences made by us in dairy meetings has this woman put into good English, in her time, and how often has she made clear what we left imperfect and unsatisfactory when struggling for expression!

At that meeting I presented a paper on standard rations for the dairy cow. That was the first time the subject of scientific rations was ever brought to the attention of the farmers of this state in a public meeting. Nothing can show better how great has been the change wrought in the last quarter of a century.

The Wisconsin State Dairymen's Association was then in its early youth—vigorous, eager, ambitious, and seeming to feel in its every vein its rapidly growing power. Dairy science was weak in those days, but dairymen's hearts were strong. Dairy practices were imperfect in those days, but the dairyman loved his calling.

There is an unexplainable essence and substance to pioneer efforts—a something in youth that is richest and dearest of all. In later times our efforts may be more finished, there may even be more to boast of, but a quality is gone, a something is lacking that we know and realize but cannot explain.

“There are gains for all our losses,
There is balm for all our pain
Yet when youth the dream departs
It takes something from our hearts,
And it never comes again.”

The difficulties which beset men in the beginning of things tend mightily to the building of character. Strong men are the natural product of pioneer efforts. These struggles bring out qualities and round out character as nothing else can. The Wisconsin State Dairymen's Association in those early days was as a lion in strength. Nowhere else in all America, I believe, has ever any body of men in an equal degree, so completely obliterated self when working for a common cause.

The Wisconsin State Dairymen's Association is the true parent of the Wisconsin College of Agriculture of today. Because of this Association's efforts and support, we have the Dairy School as a part of the Agricultural College. The Wisconsin Dairy School was the first of the kind in America and the exemplar for all others on this continent. As children of the Dairy School and this Association, we have two powerful kindred organizations,—the Cheesemakers' Association and the Buttermakers' Association,—splendid societies, each doing a great work.

The Wisconsin State Dairymen's Association is likewise the parent of the Dairy and Food Commission branch of the state government. This splendid service, now for the first time properly recognized by the whole people of the commonwealth, was conceived in the brains of this organization and born in the office of the Governor of this commonwealth when one of the charter members of this Association, W. D. Hoard, occupied the Executive chair.

Today I am proud to stand before you and recite these era-marking events. Most of the old guard that were here at that meeting of twenty-five years ago, have crossed the dark river,

and those of us who remain are not far from the brink. Thank God, we have not lost courage, more than did those noble ones who have already passed over. We await our turn, happy in the thought that we too have done something to advance the weal and welfare of this great commonwealth.

Friends, I wish today to bring to your attention, with all my remaining powers, one further great opportunity now close before the dairymen of this state.

It is a line of effort that we half recognize but have hardly measured up in its full size.

My thesis is, *Wisconsin is destined, in opportunity and its realization, to become the greatest state in the Union for the rearing of high quality, pure-bred dairy stock.*

Everywhere that dairying is carried on, there is a demand for better dairy animals. Men now-a-days go half way around the globe in search of a pure bred, high quality dairy bull or an ideal dairy cow. It is quality first and price afterwards. Wisconsin should become the great center of supply for this enormous demand. Here is a mine of untold wealth awaiting development by our dairy people. It is ours if we will only make it so.

Of all states in the Union, Wisconsin is the best in which to rear pure-bred stock of any and all leading dairy breeds. We have the soil, the crops, the pure water, the healthful climate, and, best and most important of all, the people to accomplish this great work.

There is no question about the markets. The United States and every civilized nation will today take from Wisconsin any and all of the high quality dairy animals we can possibly produce. The market is unlimited. Our farmers are now selling to other states thousands of grade dairy cows annually at from \$40 to \$50 per head, and frequently more than that. It costs no more to feed or care for a pure-bred, worth from one to two hundred dollars, or even more, than it does for the grade. There is more money in producing high quality dairy cattle than ordinary ones. Our people should enrich themselves by making this difference in production and price their own.

There should at once be a great awakening among our people on this subject. Each bright, ambitious young dairyman should

carefully study which breed of dairy cattle he can best care for. Having settled this matter, he should at once embark intelligently in the venture, aiming to make it his main life work. Heretofore we have drifted too much in our agriculture. We must look upon one line now as our life work. Our agricultural college is doing a great work in this line. Each year it is sending into the ranks of pure bred breeders of dairy stock in this state, scores of young men, ambitious to take up the work and strengthen the associations.

The next point to which I wish especially to direct your attention is the importance of co-operation in the production of pure-bred dairy stock. Each community should be single in its line of effort. A community organization should be formed which will decide by vote the breed of cattle it adopts. It will then proceed to get rid of all but this one breed, and to bring in the best specimens available of the chosen breed. This community will have choice bulls which will be used in common by the members of the community organization. Co-operation will be the watch word. There can be co-operation in advertising, in caring for visitors, in caring for would-be purchasers; co-operation in shipping stock as well as co-operation in many of the common farming operations. All of these breeders will have silos and will co-operate in filling them.

Let me illustrate how there is already an unconscious beginning of this form of co-operation. About Lake Mills one finds principally Holstein cattle. This region is now known far and wide as a possible source for this breed of cattle. The farmers about Lake Mills should keep right on in their present line. They should discard everything but the Holstein breed of cattle. They should co-operate in buying the best bulls of that breed. There should be a sign at the railroad station, visible from the car window to attract the attention of travellers passing through that station. This sign should state where and how lovers of Holstein cattle living elsewhere can get in touch with the Lake Mills Holstein Co-operative Breeders' Association. As we ride through the beautiful country about Lake Mills, we see in the rich pastures great herds of Holsteins—how attractive they are! This is just as it should be. A cattle buyer at Lake Mills a couple of years since told me that in eight months he had

bought and put on the cars at that station eight hundred head of dairy cattle, mostly grade Holsteins which he had bought up for others. We all know how cattle have gone from that station to many other states and even other countries, at excellent prices. What has been done at Lake Mills in a half-hearted, disjointed way should now be taken up by the people of that region in an organized community effort. If there were twenty times as many farmers breeding Holstein cattle at Lake Mills as now, there would be fifty times as many Holstein buyers coming to that station and leaving their good money with the farmers.

Another form of community effort which deserves the commendation and support of this association is the splendid effort at Athens, by Mr. Fred Rietbrock, of this Association. All honor to the man who has so wisely looked into the future and planned results which are now coming his way. What Mr. Rietbrock has attained has not come from accident or chance. Everything has been carefully planned.

We all rejoice with him in the well-earned success already reached, which we believe is after all but the prophecy of larger things to come. Mr. Rietbrock has not only put money into his business, but brains and wise foresight. Let the Guernsey interests around Athens expand a hundred times and there is still room for growth there, as there is room for Guernsey communities at dozens of other points in the state. There can be no over-production of high quality, pure-bred Guernsey cows.

I use the illustrations of Lake Mills and Athens to show what should be going on at a hundred other points in this state. All the high quality-pure bred dairy cows that are not needed in our own state will be eagerly taken from us by people of other states.

The times are particularly propitious for a forward movement for the breeding of pure bred dairy cows. Our dairy and food commissioner is cleaning up the cheese and butter factories of our state, so that our dairy products will bring better prices and dairying will, consequently, be stimulated by the better net returns. This splendid service will add immensely to the revenues of our dairy farmers. Our Dairy School is now turning out butter and cheese makers by the hundred each year. These will help in higher quality production. It is especially important

to know that our Short Course in Agriculture is sending back to the farms of Wisconsin each year, scores of earnest, ambitious young men who are joining the ranks of breeders of pure bred dairy cattle.

There is one question in this great problem that needs careful consideration at this point. Some of our dairy herds are afflicted with that dread disease, bovine tuberculosis. Fortunately, science has given us a quick, cheap and accurate method of determining whether cows are afflicted with tuberculosis or not. No dairyman need longer have tuberculosis among his cattle. The bacteriological department of our Agricultural College and the Live Stock Sanitary Board of this commonwealth, are co-operating energetically to drive out bovine tuberculosis from Wisconsin. Every owner of a dairy cow in the state, and especially every breeder of pure bred dairy stock, should resolve that so far as his own cattle are concerned, no tubercular specimens will be allowed to exist.

Each one must settle this matter for himself, and all should settle it alike. An honest breeder of dairy cattle will no more be willing to sell a possibly diseased cow to a stranger or a fellow breeder, than he would to put poison in the food set before a stranger when a guest at his table. My friends, we must wake up to the importance of stamping out bovine tuberculosis, realizing how intimately such effort is connected with the real advancement of the stock breeding interests of this state.

A powerful factor in the improvement of dairy cattle is the official testing of dairy cows by the Experiment Station. Records of production by dairy cows is now placed on a high plane of accuracy and reliability. When we read that a cow has officially produced so much milk and so much butter-fat, we believe it. Confidence is the basis of every business transaction. Last year the Wisconsin Experiment station placed upon the record books the accurate production of over 350 pure-bred dairy cows in this state.

The world accepts these records. The dairyman uses them to measure the efficiency of his work, as a breeder and feeder. We have had as high as eight representatives on as many different dairy farms at one time making those tests. The station welcomes more work in this line.

Mr. President, no one can look over the changes wrought during the last quarter of a century without being mightily impressed with the tremendous advance that has come to the dairy interests of this commonwealth. Every member of this association must feel a sense of pride in reviewing the result attained. More than that, he should feel that now he must double his efforts to bring full fruition as a natural sequence of the vast amount of seeding that has been done. We are just ready in Wisconsin for a great forward co-operative dairy movement. All the forces for good, built up and strengthened through these past years, must be combined, and we must have co-operative effort. Our breeders must work together. We must have communities actuated by a single motive of producing the best of dairy cattle and in large numbers. Buyers go where they can get the largest assortment of the best goods. We can bring buyers of dairy cattle to this state from distant points by the thousands, if we have the proper stock with which to supply them. But we must co-operate. The losses resultant from individual effort are appalling. Men no longer stand alone in great business enterprises in the cities. Our farmer stock breeders must learn the lesson of co-operation as farmers are learning it in other countries. Wisconsin's motto is "Forward." The times are now ripe for a great forward movement in co-operative production of pure-bred, high quality, disease-free, dairy cattle for use by the dairymen of this state, with liberal supply for other states and foreign countries.

(Added at close of paper): I understand that there is a co-operative movement on foot of cream shippers in this immediate vicinity and I wish to give them my most hearty approval. My friends, we can no longer stand as individuals, and run our own farms, and take care of our own cattle in our own peculiar way and get the results that we must get in the future. Living is high, the standards of personal comfort and convenience are raised, prices of land are going up steadily, we must have more money, we have got to do something to hold our own.

If a man comes to Wisconsin to buy cattle, he must go from one railroad station to another, from one county to another, to find even a few animals such as he may want. In breeding pure

bred cattle, we must work together. This cream shippers' organization, all these things, must meet with our hearty support, and we must get away from this enormous loss that is going on. We think we are highly educated, we measure our great progress, and in some ways we show it, but in the production and distribution of milk, probably, fully fifty per cent of our energies are wasted. The same is true of breeding; the same is true in selling stock. Let us get rid of that foolishness, let us be men and let us learn the power that comes from all working together in each community for a single purpose.

DISCUSSION.

Ex-Gov. Hoard: Mr. President, the universal American citizen hates to give up his identity, hates to co-operate, and particularly so in agricultural matters.

We have been running creameries and cheese factories here for years, and yet in the best of them they have not yet studied or learned what is meant by co-operation. When I study the history of co-operation in foreign countries, I am amazed at the lack of American comprehension and adaptation. Just think what a single cheese factory or creamery,—take one with one hundred patrons,—what do those patrons do for themselves and what could they do for themselves if they would take advantage of that one idea—for instance, what couldn't those men do in the way of purchasing feed, and yet I do not know of a single creamery or cheese factory in this state where any of the patrons buy bran, gluten or anything else.

Mr. Moore: There is one at Albion.

Ex-Gov. Hoard: Well, they say it takes exceptions to prove the rule. Now, Albion is so far back in the country from the railroad that they have got some sense; ten or twelve miles, isn't it?

Mr. Moore: Oh, no, three miles from Edgerton.

Ex-Gov. Hoard: When I used to travel from Albion to Edgerton in 1858 and 1859, it seemed to me longer than that.

But take it in the purchase of machinery, the purchase of supplies of any kind that the farmer needs, what couldn't the

patrons of a single creamery or cheese factory do for themselves? Yet who does it? Every man measures himself by himself—as St. Paul says, is a law unto himself, and there you are. Now, here comes up this new idea that is taking foothold, and is already established in Michigan in some places. They hire a man, and say, they pay a dollar a cow for putting that man in their territory, he tests some cows for tuberculosis, also for butter. He goes through a herd and along to the next man, twenty or fifty or one hundred farmers, and they pay a dollar a cow. I test my cattle every year, it costs me \$150 a year and I know how they stand. In this way every farmer can know whether he is carrying a lot of worthless animals.

Read the cow census reports that have been published in *Hoard's Dairyman*, now numbering over 12,000, and which cost me nearly \$3,000 to put that mass of information shortly before the men who care to read it,—and God knows they are too few,—and they show that about thirty-five out of one hundred farmers simply keep their noses down to the grindstone working, manufacturing milk, sheltering and taking care of cows that absolutely do not pay enough money at the creamery to pay for their food.

Now, what could you do with co-operation? Suppose that those one hundred farmers had co-operated together to test their cows and throw out the poor ones, breed up, get some ideas into their minds and make better cows. I think the Professor's ideas are remarkably sound, they are in the line of further progress. You are today treading on ground which other men foresaw for you. You are occupying ground today that other men absolutely foresaw for you and provided it for you. Why shouldn't you project ahead the ground that the boys that are to come after you shall occupy? That is the meaning of all this. Every man stands some how or other upon the shoulders of his neighbors. Some of us cannot see as far as some others can, but the meaning of progress is that he shall occupy the new ground when it comes and not refuse to occupy it.

This matter of co-operation is the coming proposition.

I just want to add one word more—you know I haven't talked very much to you at this meeting, I have spared you, and you ought to be thankful—I want to take in just this one question of

testing, to know what you are doing with your herds of cows. It is a simple thing.

Now, the past year I have just finished with my herd composed of pure bred Guernseys and grade Guernseys. I have tested the pure breds—there are only eight left of the grades—and I have been testing the pure bred cattle in this way: Every seventh week, for the whole week, the milk is weighed and a composite test is taken of that whole week, and that tested. When the next seventh week rolls around, that is repeated. It doesn't take much time, the creamery will do it for you, you can take samples for each cow and mark them on the bottle and you don't want to put in the richest milk, neither do you want to cheat yourself by putting in the poorest, though I know men who love themselves so dearly that they do love to cheat themselves, which is love wrong end first. Now, this that I am going to give you is the result. It is not large, it is good, it is fair. It is not what I could have made with this herd by any means. The cows were not fed any grain from the 15th of May to the 15th of October, but the twenty-six cows with eight heifers returned 6750 pounds of milk on the average. One cow gave over 11,000, and made 672 pounds of butter, but the average of the whole herd is what I am telling you, and that was 6750 pounds of milk, 322 pounds of butter fat, 375 pounds of butter. Three cows in that herd disclosed themselves and were discarded. I have been taking a sort of comparative test of them all along, but here was the first thorough test running for a year. Those three cows paid, but they didn't pay enough.

Now, how much better equipped am I in front of my business for that test of my herd? How much better am I master of my own comprehension and my own judgment? How much better can I demonstrate the things that I need to do to those several cows? How much better can I push one up a little and if possible, supplement her effort? How much wider is my comprehension? But it seems to be a horror to nine out of ten dairy farmers, this idea of testing their cows. One young man came to me and said that his father wouldn't have any of that humbug business of testing cows on his farm. The boy wanted it done, the father said no. Well, so many men stand with their back to the light that it is hard, you know, to get them to see.

As the fellow said, they are like a man riding on the hind end of a railroad train, they never see anything until after they have passed it. So, in this work—we come together like this and we rub together and get ideas, and the one thing I am calling attention to is put up in one word of seven letters, and that word is “Contact”—contact. The man who puts his mind into contact with books, with ideas, with thoughts, with methods, becomes a man who grows in comprehensive intellectual power. The man who narrows his contact is the man who gets smaller all the time. Education means contact.

Prof. Henry: Mr. President, Denmark has a geographical area within it of one quarter of this state. Denmark has some splendid soil and some land so poor she cannot grow anything on it, in her sand dunes. Now, from that country they send out about twenty-eight millions of dollars of exports of butter per year. In eggs, they export from ten to twelve million dollars per year. This great United States of America does not export over half a million dollars worth of eggs. The United States send abroad cotton, wheat, corn, all kinds of agricultural products, an average of \$11 worth for every man, woman and child in the country.

Little Denmark, one quarter as big as Wisconsin, and with as many people on that quarter as we have in the whole state of Wisconsin,—200,000 plus,—exports \$33 worth of agricultural products per person in the whole country.

Denmark has 350 men who spend their whole time going from farm to farm working for the farmer in these co-operative tests that the Governor has mentioned, and the farmers pay their expenses, assisted somewhat by the government. We have with us Dr. von Elbrecht, the representative of the Danish Government who is under a year's absence studying dairy problems and has been carrying on his work for some time at the University of Wisconsin, at the College. I know that he could give you some very interesting facts, but he seems to be out of the room at present.

Mr. Emery: How about the standard of living over in Denmark as compared with the standard of living in Wisconsin?

Prof. Henry: I have been through Denmark, I have eaten with the farmers and been at their meetings. I studied their

organizations and saw that they lived very comfortably, their houses are very nicely furnished.

Mr. Emery: It is reported that they eat large quantities of oleo and sell their butter.

Mr. Moore: You don't have to go to Denmark to see that.

Prof. Henry: If the Denmark farmers want to economize in that way, I have no fault to find. They export about seven millions of cheap butter and oleo and about thirty-five millions of butter.

Now, their bacon exports come from co-operative establishments. I saw one establishment where eight hundred farmers brought their hogs to one killing place, the meats were cured there, and there are dozens of places like that in Denmark.

In this country, we are scared to death by the Standard Oil Trust and other things. In Denmark they are not afraid of the great combines of packers, but those things are worked through co-operation. At this pork packing establishment the farmers get about a cent a pound more for their hogs than we get.

Little Denmark exports over \$15,000,000 worth of pork products, and they bring, next to the Irish bacon product, the highest price. It is first Ireland, then Denmark, then Canada and the cheapest grade is the United States, and there is no reason why Wisconsin farmers, at least, with their milk and grass and everything else, should produce anything but the highest priced article. We have got a start in the direction of co-operation in the creamery work. Wisconsin can afford to pay 350 men, or as many as are necessary to do the work that those men are doing.

Mr. Emery: The suggestion of co-operation with regard to the production of meat is one that should specially interest farmers. The meat question has become a vital question, and I think when you come to understand one half of the truth of that matter, you will be willing to co-operate to get some decent meat for yourselves and there will be a good market at splendid prices for what you have to sell.

Mr. Moore: The Governor started to say that there was no place in Wisconsin where co-operation is carried on, but I mentioned Albion. For eight years I was up there myself and the factory I was in had about twenty-three patrons and today it

has a hundred and eighty to a hundred and ninety patrons, and gets as high as 30,000 pounds of milk every day, and secures the highest price for its product. In addition to that, the farmers get their binding twine and we have every year a representative of that interest who comes to us and sells us binding twine, from six to eight thousand pounds, at a considerable saving. We also buy bran and gluten meal at wholesale and the farmers get it without any additional cost. Also we buy salt by the carload and when we buy salt for the creamery we have the balance of the car made up with salt for the farmers. I remember an instance where we furnished it to them for less than ninety-five cents a barrel and they had been paying \$1.25 and \$1.50 a barrel for the same kind of salt. We saved as much as four or five dollars a ton on bran. I remember Professor Henry said he would give us a certain amount of money if we would start up a laundry, and I did start one up, and I would have succeeded if it had not been for the women folks. The men could bring their dirty clothes when they came to the creamery with the milk, but the women folks were like my wife. She says, "You don't suppose I will let my clothes go in with everybody's."

I think the time is ripe to work along the lines indicated by Professor Henry.

The Chairman: There was a little bit of co-operation started along this line of breeding dairy cattle right here in Waukesha county. I know that last year, or within eighteen months at least, fifty to one hundred dairy cattle, Guernseys, were brought into one community in Waukesha county, and scattered among eight or ten different breeders. There is a nucleus for a large production, but I do not know whom to call upon to tell us about that. I see Professor Woll is here and the Experiment Station has recently given out a new idea with reference to this testing question. We would like to hear from him.

Prof. Woll: I suppose the President refers to what we call semi-official tests. Under the auspices of the Experiment Station, these tests are conducted for two consecutive days each month. Our men come to the farms and see the cows that are placed under the test, see them milked, take a sample of the milk so as to make the test and other data necessary to certify to the production of the cows for those two days. Then the

farmers and breeders keep careful account of the milk from day to day, and return to the Station the record of these individual milkings which have to be certified to under oath. Then the quality of the milk in that two days' test is taken to represent the average quality of the milk for a month, and by multiplying we get the total milk for the month, and we get the average test, and we get also the estimate of the total production of butter fat for each cow for the entire month. This is continued from month to month and gives us finally the production for the whole year. The figures of the breeders are checked up in various ways so that we have every reason to believe that when the production is certified to at the end of the year, that it is very close to the actual production of the cows.

Ex-Gov. Hoard: Why do you call it a semi-official test?

Prof. Woll: For the reason that the representative of the University cannot be responsible for all the figures in those tests on the production of the cows, when he is not there, the rest of the time the burden lies with the breeder or farmer.

Ex-Gov. Hoard: You expect to give it the endorsement of your Experiment Station officially in the same way you have previously, then why should you call it semi-official?

Prof. Woll: Because we cannot, under the conditions, testify to the absolute correctness of the yield.

Ex-Gov. Hoard: But you give it the same endorsement?

Prof. Woll: No, not exactly the same, because in the so-called official tests our man is present at every milking during the testing period, and once a week he makes a test so that the yield of milk that is certified to on those days is correct to our exact knowledge. On the other plan, for two days in each month, the tests are official, but when you come to apply the results of the two days for the entire month, then you introduce an assumption which renders the tests somewhat less accurate than on the official tests.

Secy. Burchard: Why is not the sample, the two days' sample of the product of the cow, about as good an indication of what the cow has been doing, when compared with the figures that the owner gave you—why isn't that about as accurate a sample of the cow's production as is the reading of the fat in the test bottle which takes a very minute portion of the two days'

yield of the cow, and from that to estimate the total contents for those two days? Why does not your checking up for two days afford you just about as accurate a gauge for the month's production as the Babcock test does for the amount of fat in the milk?

Prof. Woll: I think it does. And I will work it out with that end in view, to examine just exactly what conditions will be shown. But I believe that for all practical purposes, the tests for two consecutive days each month will give a true indication of the quantity of the milk during the year, as well as the average quality.

Ex-Gov. Hoard: Are you carrying on any comparative tests, —the two together, to see whether one is as accurate as the other?

Prof. Woll: No, that is not practical, for this reason: that the keeping of a man at the farm for an entire year would be entirely impractical. We are doing it with our Station herd.

Ex-Gov. Hoard: Let us see whether this semi-official test is as good as the old way.

Prof. Woll: We have data on that score already in regard to the tests that have been conducted in the past with Guernsey and Jersey cows. Our Guernsey tests, we test only one day a month during eight months in several cases. In several cases, the owner has taken composite samples at any time during the month that it happened to come and by comparison of his figures with ours that have been taken one day in the month, we find very small differences, running between one or at most two per cent.

Mr. Glover: Don't you think these two days' tests made each month come closer to the actual capacity of the animal than the seven days' test?

Prof. Woll: Yes, I think so. At the same time, I would not want to convey the impression that I consider the short, seven days' tests are of no value. But those conditions should be taken into account in judging of results.

Mr. Glover: Do they show the maximum production of the cow?

Prof. Woll: They do, if the breeder has selected the right time, the maximum result for seven days.

Secy. Burchard: Now, Professor, I think there is an explanation that should come in here that you have not suggested. Take, for example, your representative goes to Hoard, and he collects his two days' sample, or in the case of Guernseys, his one day's sample, either way, and the test may be abnormal. Don't you take a supplemental test at that same time?

Prof. Woll: No, such a thing might happen, but our men have a certain traveling route laid out for them, and it is impractical for them to stay more than one day at a time; but we can take the average of the preceding month, and the following.

Secy. Burchard: Now, suppose that that one day's or two days' test was abnormal, even in the amount of milk or per cent of butter fat, what would you do?

Prof. Woll: If it was abnormal, I would look to the average.

Ex-Gov. Hoard: How would you know it was abnormal?

Prof. Woll: If you go over the figures, that we obtain in the case of any one cow for a series of months, you will very soon know whether it was correct or not.

Mr. Glover: I tested two cows in the same herd, kept under the same conditions, fed about the same amount, and they are of the same breed. One cow produced enough butter fat to enter the advanced register; the other cow failed. Now, this test ran for seven consecutive days. I kept a yearly record of those cows, visiting the place from time to time throughout the year, and at the end of the year here are the results: the cow that entered the advanced register made 250 pounds; the cow that failed to become recorded in those records, made 450 pounds, almost double the production of the other. That is one instance, and I could cite you more, showing the importance of making more than a weekly test to find the true capacity and value of your dairy cows.

Mr. Emery: Is a test for a year a guaranty of a cow's production for a series of years? For instance, Governor Hoard tells us that in his experiments he discarded three cows. Is it absolutely certain that in that respect the Governor acted wisely? May it not be true that that was an off year for those three cows, and that another year they would have shown greater capacity?

Ex-Gov. Hoard: No, their previous records confirmed that test.

Mr. Glover: The Babcock test gives accurate records for the time being, but do not take the results of one month or one year to determine the true value of the cow. Take in consideration the ancestry of that cow, her dairy form, her conformation, and then, together with her history, her pedigree, so to speak, you are able to determine whether that cow is going to be a profitable animal, but not in one year. Scale tests become valuable only when they are used for a series of years.

Mr. Emery: Is the guaranty of the production of the year greater for a series of years than the seven days' test for a series of days?

Mr. Glover: No, sir.

A Member: Do you tell these farmers that if they go home and test their cows and make up their minds that certain ones are not paying, that if they go and sell those cows they might pay next year?

Mr. Glover: Don't sell them. I caution farmers not to dispose of their cows on one year's test, for any man who has studied the question knows that a one year's test does not determine the value of the cow. For instance, Sweet Briar, one year she would make 200 pounds; the next, 400; the next, less than 200, and the next, 500, but at the end of ten years' work, Sweet Briar had placed to her account 350 pounds average, a year; she was a valuable cow. If you had taken the Babcock test and the scales and gone into your herd and Sweet Briar had been there and you had struck a year when she made only 200 pounds or less and had sold her, you would have sold a valuable animal. Don't go too fast in this matter, or you will make serious mistakes.

Ex-Gov. Hoard: And still do not take it from what Mr. Glover has said that you should not test your cows, that it is no use testing them.

Adjourned till 2 P. M.

Convention met at 2 P. M.

President Hill in the chair.

The report of the committee on exhibits read by Mr. Searles and adopted.

The Committee on Exhibits and Dairy Machinery would respectfully report that the eleven entries of butter show by the average score of 93 that its quality is above the average for this season of the year.

The average score on the three entries of cheese was 93 1-3, the average being brought up greatly by the box of twin cheese exhibited by Otto A. Kielsmeir of Manitowoc, the exceedingly high score of 99½ shows that care has been taken both in the production of the milk and in the manufacture of the cheese. Patron and cheese maker are to be congratulated upon this excellent product.

The exhibit of Dairy Machinery is small, there being but four of the standard make of hand separators, namely, the Empire, the Sharples, the United States and the Iowa.

The exhibit of the James' cow stanchion should give to the dairyman an idea in providing comfort as well as cleanliness for the animals in his stable.

The Model Silo exhibited by the Creamery Package Mfg. Company, we hope will interest all dairymen.

It is the opinion of the Committee that a larger exhibit of *both* dairy products and dairy appliances would be of great educational value to the visiting farmers and dairymen.

H. C. SEARLES.

TREASURER'S REPORT FOR 1905.

Mr. President and Members of the Association: The following itemized report is made showing the source from which all moneys paid into the Treasurer's hands were received and the disbursements paid on orders from the Secretary which I hold as vouchers:

Receipts.

1905.		
Fel. 20.	Amount in hands of treasurer.....	\$1,024 60
	Memberships	242 00
	Sale sweepstakes cheese	9 00
May 20.	From state treasurer	2,000 00
Dec. 7.	From Mr. Rietbrock for work by in- specter	54 15
1906.		
Jan. 30.	From state treasurer	1,000 00
31.	Memberships	6 50
		<hr/>
		\$4,336 25

Disbursements.

Feb. 20.	Hotel bills at Wausau and Prof. Beach, services and expenses	\$187 75
	Mrs. Adda F. Howie, expenses, Wausau convention	12 49
	E. H. Farrington, expenses, Wausau convention	11 02
23.	P. H. Kasper, premium	15 00
	W. J. Hine, premium	15 00
	A. E. Dixon, premium	15 00
	C. M. Kates, premium	14 50
	J. E. Bretcher, premium	13 17
	E. A. Faddock, premium.....	13 17
	Carl Bjerregaard, premium	13 17
	Albert Erickson, premium	10 54
	W. F. Kohn, premium	7 90
	E. L. Duxbury, premium	7 90
	James Van Dusen, premium	6 60

	Fred Reitbrock, premium	5 27
	Sunset Creamery, premium	3 95
	Cleveland Creamery, premium	15 00
	Nick Grimm, premium	10 54
	A. Bruhn, premium	10 54
	H. E. Braumann, premium	5 27
	J. F. Bachmann, premium	13 17
	F. H. Scribner, expense attending convention	12 60
	G. W. Burchard, expense attending convention	10 26
	E. L. Aderhold, expense attending con- vention	5 46
	C. P. Goodrich, expense attending convention	15 20
	Chas. Hill, expense attending conven- tion	18 31
	T. Cornelluson, expense attending convention	11 89
	H. C. Taylor, expense attending con- vention	35 49
	W. J. Gillett, expense attending con- vention	12 55
	Geo. C. Humphrey, expense attending convention	14 02
	A. D. De Land, attending executive committee meeting at Madison.....	11 60
	H. K. Loomis, attending executive committee meeting at Madison.....	10 40
Apr. 7.	T. Cornelluson, instructor	182 50
	Mrs. A. L. Kelley, reporter	120 71
	C. P. Goodrich, attending board meet- ing	2 64
	Fred Marty, instructor (supplies)....	1 75
17.	E. L. Aderhold, instructor	91 50
May 10.	T. Cornelluson, inspector	111 00
	E. L. Aderhold, inspector	136 50
June 10.	Henry Elmer, printing report	87 98
	T. Cornelluson, instructor	135 00
	E. L. Aderhold, instructor	158 00
15.	Fred Marty, instructor	140 00

July	8.	Fred Marty, instructor	100 00
		Fred Lanz, for Wisconsin curd test...	10 75
		E. L. Aderhold, instructor	164 00
		T. Corneliison, instructor	125 00
	31.	T. Corneliison, instructor	5 00
		E. L. Aderhold, instructor	69 50
		Fred Marty, instructor	75 00
Aug.	16.	H. K. Loomis, expenses attending executive committee meeting	8 98
Sept.	16.	Peter Zumkehr, instructor.....	165 00
		John Luchsinger, personal account...	15 75
Oct.	4.	H. C. Searles, instructor	130 50
	9.	Peter Zumkehr, instructor.....	125 00
Nov.	4.	H. C. Searles, instructor	122 45
		Peter Zumkehr, instructor	130 00
Dec.	6.	H. C. Searles, instructor	130 05
1906.			
Jan.	5.	H. C. Searles, instructor	136 50
Feb.	6.	W. D. Hoard, printing	22 00
		G. W. Burchard, secretary, services and expenses	276 20
		H. C. Searles, instructor	126 80
		Chas. L. Hill, expenses for year.....	20 02
Balance in hands of treasurer			645 44

\$4,336 25

The Secretary read a letter from Milwaukee, signed by the Citizens' Business League, and another one from the Mayor of Milwaukee, both inviting the convention to hold its next meeting at Milwaukee, and the Secretary was instructed to acknowledge with thanks the invitation so extended, and to say that the matter of fixing the place of meeting next year is left with the executive committee.

Mr. W. W. Marple was invited to address the convention, especially in regard to the National Dairy Show in Chicago, February 15th and following days. In doing so, he concluded with a most eloquent description of the dairy cow and her contribution to civilization.

RAISING DAIRY COWS AND HEIFERS FOR MARKET.

Ex-Gov. W. D. Hoard, Ft. Atkinson.

Mr. President, Ladies and Gentlemen: I am, if I can bring you down to earth after Bro. Marble's peroration, to call you to a sober, close, practical contemplation of a topic which is today with you commercially, with you practically, with you as a farm proposition.

I enjoyed Bro. Marble's talk exceedingly well; almost any old soldier would like it. From the 21st day of May, 1861, to the 4th day of July, 1865, with a short interval, I saw something as a private soldier, of the great conflict which gave us, like an earthquake, a tremendous upheaval, and I have often felt in my heart of hearts, that I could not wonder at the bitter feeling that is entertained, particularly by the Southern woman, for she bore the burden of the war as no other being did, be he man or woman. She saw "war's wide desolation" in the death of her kindred, in being driven forth by that conflict which Sherman so aptly characterized as "hell." She saw it while her Northern sisters abode in the homes of peace and contentment. No wonder then that she feels often as she expresses herself today over the result of that conflict.

But a larger, wider, broader providence than either she or her brother, had ordered this great conflict, and that out of it might come, as from ashes, the uprising of another sphere, the upbuilding of a broader thought, the cementing of a new form of American civilization, and it has come and is coming.

I have presided at four agricultural conventions in Mississippi. The Southern people are particularly an emotional people, and I wouldn't give much for anybody in the routine of life that had no heart in the life they live. I remember attending the first convention; my wife was with me, and it was at Jackson, and just before they called the convention to order, the local executive came and told me I was selected to preside. I had not been in the state of Mississippi since the war; here was a delegation of three or four hundred people from the North, and this vague and uncertain thing that might come from the contact of

these two sections, and they had never said a word to me about presiding, and I said I wouldn't do it. Well, you know, particularly you old fellows here like myself, how a woman can tip the scale with a man, and I felt my wife's sharp elbow in my ribs, and the injunction, "Go along!" so I went along; I went up to the speaker's stand, buried as it was with flowers and commenced to talk in a sort of perfunctory manner—I couldn't tell how exactly—I tried to get my mind under my feet, you know, but what I said sounded as tame and meaningless as could be. Suddenly there arose before me a vision, and the vision seemed to have tongues, and it said, "You old fool, what are you about? You must get ahold of this people; you must say something to them that means something, for you can't help yourself." Then I concluded I would throw myself square at them from the standpoint of man to man, and I stopped a moment, and said, "This is the second invasion that I have participated in on Southern soil." Instantly I saw every ear, you might say, pricked up, and I looked over that audience, especially among the women, and could almost hear them say, "What is that blamed Yankee going to say next?" Then the vision arose before me again, and I said, "The first invasion brought woe and tears, destruction, desolation and devastation, and it was a great mistake; it never should have occurred, but like all great mistakes it knew no solution but the bitterest, it had to be fought out. Thank God, it has passed like a nightmare. Hundreds of times down here in this Southland at night on the picket line, have I heard this cry go up, 'Hello, Yank!' 'Hello, Johnny!' 'Throw down your gun, come over here and let's swap.' And from out the serried ranks of two great warring sections would step two of the common representatives of the common wants of our common human nature, and proceed to exchange, oblivious of war."

"Why not may the cry go up again, 'Hello, Johnny!' 'Hello Yank!' Throw down your prejudices, come over and let's swap.' And out of that audience, suddenly burst the old rebel yell. I hadn't heard it for years and when it came the goose pimples went up on me. But everything was all right; we staid there four days and fought out a lot of questions. Sometimes a dozen of them would be on the floor, clamoring for recognition; some-

thing had been said that struck the right chord, and I had only to stop a minute and look at them and say that it was all right. And so we had session after session, we learned many things, I saw what a wonderful people they were, what a wonderful empire there is in that Southland; they want to build their country up, they are seeking the gospel of the cow, which is also going to be the salvation of Missouri where Bro. Marple comes from.

Once in a while we hear somebody talk who is worrying about an oversupply of dairy cattle and products in Wisconsin. Do not fear it. The growth of cows in Wisconsin is only about five to six per cent annually, and the growth of population and consumption is so vastly ahead of the production that today, with our wonderful army of cows at work, the market price for their products is higher than it has been in ten or twelve years, and bears a higher relative price than that of any other agricultural production. There is no fear of overproduction, except of poor goods, that is all. The production of poor butter, poor milk and poor cheese is the outgrowth of ignorance and stupidity, which this Association has set itself to destroy, if possible. I find that everywhere poor dairy products are an outgrowth of ignorance.

There was a time when, the Bible says, God winked at ignorance, but He does not do it any longer. No, He got tired of winking and He has, instead, a Dairy and Food Commissioner in the shape of Professor Emery, who will not wink, but hit. He works through human agencies, along these lines, through commercial forces, through legislation and everything else to extinguish and extirpate ignorance. We are in the twentieth century, in a land of schools, a land of newspapers, a land of thought, and—yes, churches. Still some of the most ignorant men I know are right in the church.

My friends, your presence here today is a cheering thing: in the last hour of this convention, after you have filled this room as you have, from day to day, it is a wonderfully cheering and encouraging thing that in this community of Waukesha county the old gospel yet rings true. We have spent here three days in heart to heart discussion of important topics, trying to get the mind, the mental concept, right, knowing that if the thought is

right the man goeth right. If the thought is wrong, the man goeth wrong. We have been trying all the time to work for the right ideals.

Now, I am to talk to you this afternoon upon the question of Raising Cows and Heifers for Market.

In the beef sections of the country, the one object of every farmer is to raise cattle for the market as beef animals; feed for beef, breed for beef, house for beef, handle for beef; and that is a great, broad proposition that is forming the thought and study of thousands upon thousands of farmers.

Now, I say to you that the time has come when you, as farmers of Wisconsin, should turn your thought just as squarely and definitely toward the production of cows and heifers for the market as cows, as the beef men produce steers for beef.

One-half of all the offspring of cows are males, one-half females, and yet statistics in the state of Wisconsin show that if we have a million cows and there should be a million calves and a half million heifers and a half million males, that after all only about five or six per cent of the females ever come to cowhood.

Now, that shows you that there is a force at work somewhere that is reducing very powerfully the productive power of the female side of the house. There are a number of things that fix the fate of the heifer before she reaches cowhood. In a large proportion of instances,—so large that it has become a very serious waste,—she is not worthy of making a good cow; she has not the cow property or element in her, and she goes to the block along with her brother, the steer.

There are just two points I want you to consider that comprehend this proposition.

First, let me say, however, that there is a tremendous demand for good cows. You may not think it, but there is a tremendous demand for good cows. I live in Jefferson county and can demonstrate it to you, and I want to speak to you a moment as to the effect of the dairy industry upon that county. It has 36,000 inhabitants by the last United States census. It has about 40,000 cows. That county is twenty-four miles square, and it has nearly one hundred creameries and six cheese fac-

tories. That county, twenty-four miles square, is enriched every year by her cows dropping two million of dollars into that area. Two million dollars are earned by the cows of that county every year. The average production in butter is about 250 pounds per cow, and that cannot be equalled by any county in the United States today. Silent forces have been at work on the minds of those farmers, largely German, that today are shown in that wonderful percentage of quality in those cows. The total valuation of her agricultural production is about five million dollars, including her beef crop, her pork crop, her calf crop, and whatever grain crops she markets, her hay and butter crops, all of these.

Now, in addition to all those things, this last year Jefferson county has sold cows and heifers to go abroad into various portions of this and other countries, notably Mexico, nearly a half million dollars' worth. John Widmann stood before you yesterday, talking to you about alfalfa; there is a young German who had the sense and wit to see that his course should be toward the broadening way, that tomorrow he should be a little farther along the road toward a higher comprehension of what dairying means, and the next day a little farther, and he has done that by studying, reading, thinking. He used to come to me repeatedly for informatin; he would ask me, "Haven't you something to read?" and I would give it to him, and so he has been a student.

Now, what is the result of that study? Last year, a gentleman came up from Mexico and bought four carloads of cows, one of them of John Widmann and paid him \$2,600 for twenty-five cows, a few of them registered, most of them high grade Holstein cows. I tell you, that went deep into the minds of a lot of stupid men; men who did not think it paid to study and read, but they saw that John had fertilized his mind.

Now, that is a single, concrete instance of what I want you to take into your minds as indicative of the goal that I want men to work toward.

Out of Fort Atkinson and Lake Mills have gone the past year, I might say, hundred of carloads of grade cattle, cows that have been bought and taken to old Mexico, to Nebraska, to Ohio and the Eastern milk-producing districts. To such an extent has this reputation grown concerning Jefferson county cows that we

are today seriously hampered; the creamery men are complaining that the cows are taken away at high prices, from \$40 to \$75 per cow. You see how this influence has been at work, and there are just two points that are working in the mind of the Jefferson county farmer, helping to bring these things about. First, the right kind of a sire, a dairy bred sire, for that gives value in the mind of the buyer to the heifer and the cow that is to be. It does not give value for the time in the mind of some farmers, because they have no concept of what the buyer wants, and so they say that anything will do in the way of a sire. The result of this false estimate is that I can go into Waukesha county and into some parts of Jefferson county, and I will find farmers who have bred to a Jersey sire to get richness in the milk, and then bred to a Holstein to get quantity, and then bred to a Guernsey to get color, and then to a Shorthorn to get size.

All this comes from looseness of ideas, a lack of well defined thought in the mind as to what a man should do. You can't breed cattle that way and secure a high degree of excellence, and yet a great mass of farmers love to fool themselves trying to do that very thing.

Now, the Jefferson county farmers have learned, to a large extent, that they must breed in a straight line and they must have a thoroughbred sire to do it with. If they want Guernseys, they breed from a thoroughbred Guernsey sire; if Holsteins, from a thoroughbred Holstein sire; they are keeping on in that way, and the result is that men come there who are scouring the country for grade Holsteins and grade Guernseys. At the bottom of all this is a clean, definite adherence to the value of the sire, in the mind of the farmer.

Now, then the other point. The care and rearing of the heifer calf. If I can get the farmers entrenched solidly on that first point, the sire, and then on the second point, nature will take care of herself between them. Let us talk a moment upon the rearing of the heifer calf. For several years, every spring, I have turned off a little bunch of twelve to fifteen grade Guernsey heifer calves at about seven or eight months old, dropped in the fall, reared carefully in the winter and sold in the spring for an average in the past three years of \$22 apiece. All I have had to do was to put a little advertisement in the Dairyman,

saying that I had such a bunch of calves to sell and the answers would come to me as far east as Pennsylvania and as far west as Washington or Montana, and I could have sold fifty just such calves, or more, if I could have had enough to make a carload. One man wrote me that he would take three carloads of such calves with a registered Guernsey bull calf if I could find them for him, but I couldn't, simply because there were not enough men about me breeding and rearing calves in that way who would supply this demand.

I could go out and buy a dozen carloads of scrub things, every calf standing in mute protest against the ignorance of the man that reared him and against his heredity. I could go out and buy lots of such calves for five, six and seven dollars apiece at that age, when I was getting \$22 for a well marked Guernsey grade heifer calf, or my neighbor over there the corresponding price for a well marked Holstein calf.

Now, these things have made an impression upon me, and I want to tell you that I figure out that I receive for my skim milk fed to those calves—53 cents a hundred pounds—almost the price of full milk in the cheese factories in the country in the summer. Now, how is it done? I fed those calves a dollar's worth of oats; fifty cents' worth of dry blood meal, that I procured at the packing house in Chicago; a dollar and fifty cents' worth of alfalfa hay; that makes \$3.00. I allowed \$3.00 for the carcass, that is \$6.00, and six from twenty-two leaves sixteen dollars. Then, they consumed 3,100 pounds of skim milk. I call it 3,000 pounds for easy calculation, and I credited the sixteen dollars to the skim milk, the rest of the food I had been paid for. Probably the scientists would say I could not, that I could not credit it all to the skim milk, but I paid cash for the other stuff and was paid back for it and I give the skim milk, 3,000 pounds of it, credit for the balance or \$16.00. That went into the calf. Now, you see that made the business exceedingly profitable to me. But lots of men say, "Oh, well, maybe you can do it, but I couldn't." So every man turns his face away from the truth and undertakes to put an excuse between him and the truth. These calves were sold to farmers and I could have sold a lot more for the same price.

Now, the right rearing of a calf is really a fine piece of work.

and I am going to spend a few minutes in telling you how these calves were reared.

The only place in the barn where I use a stanchion is in the calf stable. The stanchions run down one side and across the end, and this little stable is ventilated on the King system, so that they can have pure air, and there is a dirt floor, which is taken out every year and fresh dirt put in, and then it is covered with a heavy layer of straw, and every morning that is raked back and whatever is foul is taken out, and every morning that dirt floor is disinfected, because I am dealing with a baby. Every mother knows that a baby must be kept dry and clean or it absorbs poison enough to sicken it; and the bovine baby is just the same. You shut these calves up in the winter and give them no opportunity to move about; they will lie down in a clean place always if they have an opportunity, but you shut them up and force them to lie in their own filth and they sicken, they do not thrive. But you put them into a stable like mine, give them fresh bedding, disinfect it, see that it is sweet and clean and also that this stable is pervaded with pure air, which always means circulation—you cannot blow good air into a room unless you let the foul air get out, so you must provide for the taking out of the foul air as well as the inlet of the pure air. These calves are given pure air to breathe. You step into that stable and you can hardly smell the odor of a stable. You step into my barn stable, one hundred and forty-two feet long and thirty-six feet wide, with over fifty animals in it, even after it has been shut up all night, and you will hardly smell the presence of cattle in it. You may smell a little of the silage odor, but that is harmless.

What is the meaning of that? It means that in that stable the air changes every hour, and the foul air is drawn off and the pure air comes in; the cows are bright and clean and their eyes are bright; they eat well and do good work. The same law applies to the little calf stable.

The calf is allowed to remain with the mother until she has passed the milk fever stage, that is, three to four days. It is then taken and weaned, and once in a while we have a stubborn one. I have just got one taught to drink after six weeks; we had to turn the milk down its throat with a bottle, but, of

course, the calf must learn to drink. It is kept in a little stall by itself, constantly bedded and kept clean, until it is big enough, at the end of about four weeks, to go into the calf pen. There they are divided again and the larger ones put by themselves, so that the calves are sorted to run together nearly about a size. When the skim milk comes in from the farm separator every morning and evening, warm and sweet, each calf is given its allowance in its pail, and the pails are clean. Many a calf sickens and dies from the pail that he has eaten out of being foul. These pails are cleaned and steamed and every effort made to give the calf sweet, clean milk. This calf's bed is renewed every day, a heavy bedding of straw. I will buy straw of my neighbors before I will let my calves suffer, and I have bought as high as a carload of baled shavings. There is nothing I invest in more cheerfully for my cattle than in bedding; it tells in the appearance of the animal at once.

Now, when this calf has learned to drink, she is given for about four weeks, about a couple of quarts of whole milk until we taper off into the skim milk alone, fed warm and sweet. She is put into the stanchion when she drinks and is kept there for an hour and given her oats, and then a little alfalfa is thrown to her and she gets over this baby instinct of sucking. If you turn them loose immediately after feeding them their skim milk, they will go to sucking each other's ears and they will get sickened in that way, but hold them in the stanchion for about an hour and they will begin to lick up their oats. I like to feed a little ground barley with the oats, I am a great admirer of ground barley in my dairy.

After an hour she is turned out in the sun at a time when the cattle are not in the yard; we like to give the little fellows all the liberty we possibly can.

Now, under that usage they thrive so nicely that these men come along and willingly pay me \$22 a piece for seven and eight months old calves.

I have put these facts before you, and I want you to digest them, and I ask you, don't you think it pays me? The skim milk I fed to my hogs last fall stood me in 20 to 25 cents a hundred; the skim milk fed to these calves stood me in 53 cents. Now, if every man who has a grade herd should say to himself, "I

will have the best sire I can find, a prepotent, well bred, well appearing sire—no combination, gentlemen, but one that has heredity in a straight line”—if you will have that kind of a sire and then will rear the heifer half in this way, you are bound to develop a fine cow, or the material for one.

I am receiving reports from some of these calves I have sold. I sold the first bunch three years ago, and the gentleman writes me that not one of those calves but what turned out a superior heifer, and they were nothing but grades.

Now, what do you think did that? First, the influence of their father in their veins; he came down from a long line of strong, heavily milking mothers. Furthermore, you will find often in the mother an influence giving that calf a bent toward maternity.

Then, second, good usage—right rearing as a calf, kept growing and developing. Now, the function of maternity calls for development; this calf cannot become a good mother unless she is developed well, but many a man puts a bar right on her development and sets her back and wonders that she is not a good cow.

Now these are the facts: First, the market. The market today is calling for more than men can give, but, mind you, they want clear, straight-line grades. They do not want a “grand combination” in grades, they want dairy-bred heifers of one line of blood in the sire. So, select the sire, then grow your heifer right and you need not worry about the result.

Gentlemen, I am very much pleased to have had this opportunity to address you.

DISCUSSION.

Mr. Goodrich: I want to add a little advice that I have culled that tends to show something of this effect of mixed breeding. You know in this last cow census that I took, I described one man that had twenty-five cows. I saw in those cows some little symptoms of the Jersey blood—I could see the mealey appearance about the nose, and that is the last thing that disappears of the Jersey characteristics. So I said to the man, “I see

some Jersey blood here." "Yes," he said, "I had a Jersey bull once." Then I looked a little further and I saw something that resembled Ayrshire a little, and I spoke about that, and he says, "Yes, I used an Ayrshire awhile." Then I saw something that looked like some other breeds, and so there were all kinds, and in that herd I found the cost of the feed was \$26 a year and on the figures given me by the man's own statement the results from the creamery showed \$22 a year.

A few years ago I took a cow census in the vicinity of Fort Atkinson for Hoard's Dairyman. I took the census of seven hundred cows and I tried to figure out all the valuable lessons that I could. I was continually being asked, "Which is the best breed of dairy cows?" and I figured it out this way—I will say that where the Jersey blood predominated I called those cows Jerseys, and the same way with Holsteins and so on. Among those seven hundred cows there were twenty-eight herds of Jerseys, 466 cows, the average product of whose milk was 4,798 pounds, butter, 244.7 pounds. For each dollar's worth of feed they returned \$1.62, so that the average net profit per cow was \$17.58.

With the Holsteins, there were nineteen herds, 450 cows; average amount of milk per cow 6,080; average pounds of butter, 255. For each dollar's worth of feed they returned \$1.50; the average net profit, per cow, was \$16.99, only 59 cents below the Jerseys. Of the Guernseys, there were eleven herds, 185 cows; average pounds of milk, 5,141; pounds of butter per cow, 252½; for one dollar's worth of feed, they brought \$1.60; the net profit per cow was \$17.92. So you will notice those three breeds run almost exactly parallel as to profit, so how can I say which is the best breed? I didn't fix up a theory, I was hunting for facts.

Now, then, about mixed dairies; there is some mixing there in Jefferson county. There were nineteen herds of this kind, containing 346 animals: the average amount of milk per cow, 4,455 pounds, the average amount of butter per cow, 208½; 40 pounds below the others. Now, what was the cause? Was the trouble with the cow or the man? Perhaps both. The man did not have a definite purpose. He did not have a determination to do the best he could, but he would start in one direction;

he would get discouraged, then he would run in another direction, and if you keep zigzagging that way, you will never get anywhere.

There are very few men in Jefferson county who believe in a dual purpose cow, but I found four herds, 54 cows. the average amount of milk was 4,219; the amount of butter was 194.4 pounds, and one of those men owning such cows, was the one that owned the farm that John Widmann is on now, and is making lots of money on, and he was sure in his own mind that he had the best cows in the county.

Mr. Race: Do you warm the milk after separating?

Ex-Gov. Hoard: No.

Mr. Race: How much oats do you feed a calf? You spoke of feeding them until they were six or eight months old.

Ex-Gov. Hoard: I said a dollar's worth in the whole time; that would make about three bushels. I fed them whole. I think it would be better if they were crushed or rolled at first but in about six weeks the calf begins to grind them. It begins to raise a cud in about four weeks, and it is a great thing to watch it when it begins to do so.

Mr. Blackwell: How do you feed the blood meal?

Ex-Gov. Hoard: It is put in the milk. I give the calf, with the skim milk, about two quarts a day whole milk, at first; then I run it off into skim milk.

Mr. Race: Isn't there danger of introducing some disease through the blood meal?

Ex-Gov. Hoard: No; it is submitted to a heat of about 250 degrees. They catch the blood from only the healthy animals. I find it very useful.

Mr. Emery: How many times a day do you feed your calves?

Ex-Gov. Hoard: Twice, morning and night from the separator. I commence on the blood meal, with about half a teaspoonful at first and gradually enlarge it until at the end of six or seven months they are getting from one to two teaspoonfuls.

Mr. Emery: Do you give them anything in the skim milk as a substitute for the butter fat taken out?

Ex-Gov. Hoard: Sometimes I have used ground flaxseed where I thought they needed it, but with alfalfa hay I have no difficulty whatever.

Mr. Emery: Do you feed silage to calves?

Ex-Gov. Hoard: No. It is a little unhandy to go from the calf barn to the silo, though I do not believe it would hurt them. What I am after is a constant use of protein food for this young calf. I give skim milk and alfalfa hay, oats and the blood meal.

Prof. Henry: That is right.

A Member: If the silage was real handy, would you give them any?

Ex-Gov. Hoard: I don't think I would.

The Chairman: Isn't there another point, that you wish to develop a large digestive capacity?

Ex-Gov. Hoard: Yes, I like to develop a calf with a good, harmoniously developed barrel.

A Member: Do you water your calves?

Ex-Gov. Hoard: Yes, the water stands right there in the tank.

A Member: Did you ever lose a calf by bloating on cold water?

Ex-Gov. Hoard: No, not cold water, but I lost a calf worth \$100 from sudden bloat. The men neglected to clean out the pail it was fed from.

Mr. Emery: Why do you use the ground instead of a wood floor?

Ex-Gov. Hoard: Because it will absorb a little better. I carry out the dirt next spring as manure.

Question: What disinfectant do you use?

Ex-Gov. Hoard: Zenoleum or creolin.

Question: How often do you use it?

Ex-Gov. Hoard: Every day, and land plaster besides. I use land plaster in my stables all the time.

Mr. Race: You prefer it to air-slaked lime?

Ex-Gov. Hoard: I never would use lime.

Prof. Henry: I think we are going one step ahead on land plaster. You can buy ground rock phosphate for ten to twelve dollars a ton, delivered from the phosphate mines in Tennessee. You can put that on manure and use it as land plaster, and you are then introducing phosphates. Professor Whitson's experiments in some parts of this state and in Illinois show that this can be profitably done from Illinois clear up. Now, by buy-

ing this phosphate rock at those low prices we get a disinfectant which conserves the ammonia in the manure, and the manure acts on the phosphorus in this rock and tends to set it free and we get phosphorus in a very cheap form and it is highly valuable. I commend it to our farmers. I believe the time has come when large quantities will be used with great benefit to our land.

Ex-Gov. Hoard: I have been trying to get it, but our dealers don't keep it.

Prof. Henry: If you and your neighbors would combine you could buy a carload.

Ex-Gov. Hoard: I can't convince my neighbors they should buy phosphates. I can't get them to pay anything for salvation.

A Member: What is the difference between phosphates and nitrate of soda?

Ex-Gov. Hoard: Nitrate of soda is nitrogen.

The Member: I have been getting a great many pamphlets about nitrate of soda.

Prof. Henry: Don't buy the nitrate of soda. Your clover crop, and specially alfalfa, will bring \$16 to \$30 a year out of the air, so you don't have to pay for that. You don't need it for that purpose.

Ex-Gov. Hoard: We can't make one thing stand in the place of the other. One of the real useful things about blood meal is that it is a remedy for scours in calves. You know they are very apt to get scours and blood meal seems to be one of the best remedies we can use. It costs about \$3.00 a hundred pounds. You can have it sent to you from Swift & Company, from the Union Stock Yards at Chicago, or Armour & Company, and get it easily. Send them the money and they will send it to you.

Prof. Henry: I guess they are not all licensed to sell it here; those two are.

Secy. Burchard: Sixty dollars a ton for a feed seems a large price. The question came in to us the other day: "Can I afford to pay \$3.00 a hundred pounds for blood meal to feed to calves?" The answer to it was, that blood meal was fed by ounces with the other feed, while the other feed that he mentioned was fed by the pound, and when you come to compare the protein contents the blood meal is much cheaper. Do not be frightened by the price of blood meal; you feed it by the teaspoonful at first.

A Member: What quantity of skim milk do you feed and how often?

Ex-Gov. Hoard: That depends on the calf somewhat. You know a feeder has to stand in the place of the good mother, and he has to have—that old word—I wish it were used more than it is—he has to have “gumption;” he has to be the judge of the condition of the calves. When my calves begin to show they are off, they get less feed until they come back to their appetite and tone. I feed all the way from two to four quarts of milk to a feed twice a day, and I am very careful not to overfeed my calves, but to feed enough so that the calf shows in the hair and the eyes and the general look that it is thrifty and growing, but not to fatten it. I don’t want to make veal of it. I have the oats right there in front of the stanchion and they start on them as soon as they want to. The older ones will eat them up and the younger ones will pay no attention to them at first but the example of the older calves will soon set them eating the oats and hay.

Mr. Rietbrock: What do you do with your male grade calves?

Ex-Gov. Hoard: Sell them at ten to twelve days old to calf buyers at about \$3.00 a head. I don’t pay any attention to the male.

The Chairman: You see to it that the grade male does not remain in the country?

Ex-Gov. Hoard: Yes. Now, I have given you a justification of my work in the profits that I get. I have told you the prices that I get, and they are not high. It is a thing that every farmer can do, not something that a thoroughbred breeder only can do. Come to my barn and look it over, and you will not find a thing in it that the commonest man in the world cannot do. Mr. Washburn, the Dairy and Food Commissioner of Missouri, was up there the other day and looked it over. Mr. Washburn said, “I am glad I visited your farm for the reason that there are no frills about it, there isn’t a thing about it that I can see that the commonest man cannot do.

A Member: What do you do with your calves in the spring?

Ex-Gov. Hoard: I sell them.

The Member: But those that you do not sell?

Ex-Gov. Hoard: There are no grades I do not sell. I want

all my calves to be dropped in the fall if I can. I can rear a calf through the winter, dropped in the fall, say, September, October or November and turn it out the next May. At the end of eight months, I can put a calf on the market at least thirty to forty per cent ahead of what I could do if that calf were dropped in the spring; and for the reason that I can control the temperature more easily and I can control the feed and I am absolutely relieved of the effect of flies for eight months in the beginning of that calf's life, and he gets a start. Now, if he is dropped in the spring, he walks right straight into the rapacious jaws of the flies, doesn't he?

Mr. Emery: I thought the fly's jaws walked into him.

Ex-Gov. Hoard: Well, reverse the operation and it doesn't give the calf much relief then.

Mr. Emery: Do you feed the calves any grain in summer?

Ex-Gov. Hoard: Oh, yes, I feed my calves that are dropped in the spring. I feed my thoroughbred calves oats until they are a year old right along, and feed them milk until they are about ten to eleven months old. I want to develop this registered calf that I am dealing with so that in the end she will make just as strong and vigorous a breeding mother out of that heifer as I possibly can. Now, I will tell you what my registered cow earns me after I have her developed. The creamery pays \$76.27 for the milk, and the calf brings \$100, so you see that good cow earned me from \$177 to \$200 a year and her keep cost me \$31.60. There is an opportunity for me to get a good profit and the demand is so great that I can't keep it supplied.

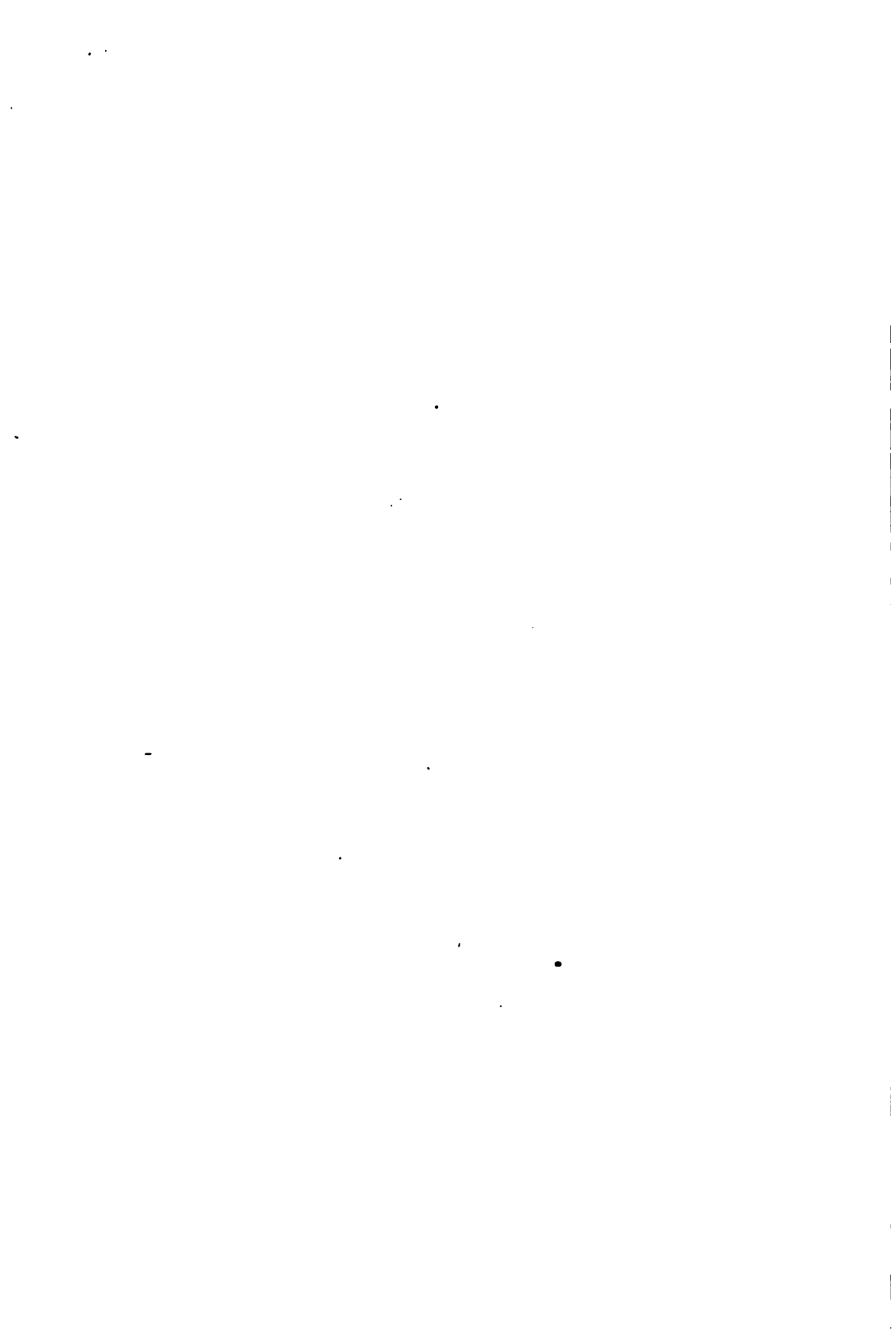
A Member: At what age do you have your heifers drop their first calves?

Ex-Gov. Hoard: I have been having them calve at twenty-four and twenty-six months, but I am changing over to have all the heifers to drop their calves when they are two and a half years old.

The Chairman: We have had a whole lot of good talk, but we have reached the limit of our time.

We wish again to thank our friends for their courtesy and all the members for their attendance and careful attention.

This convention is now adjourned sine die.



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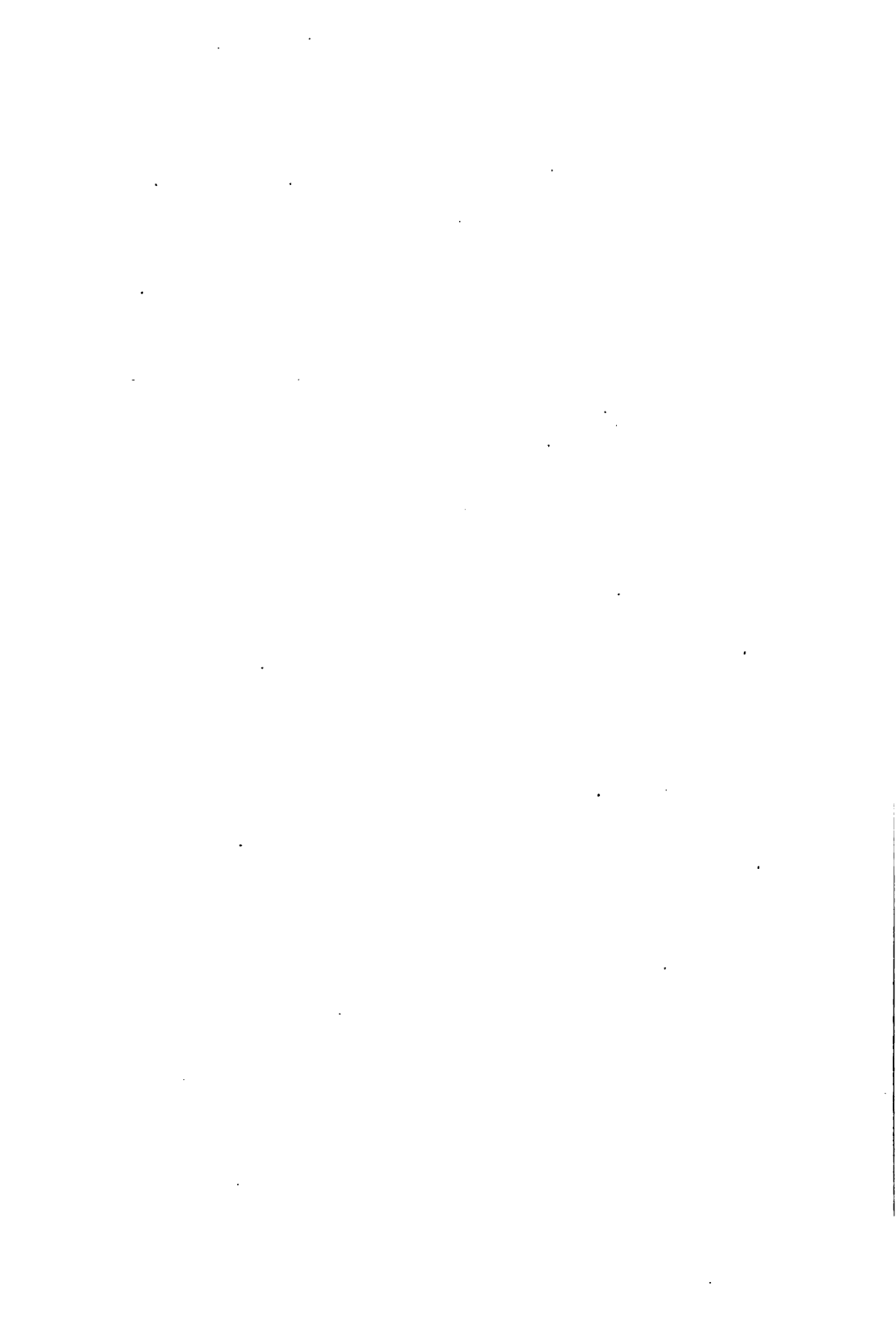
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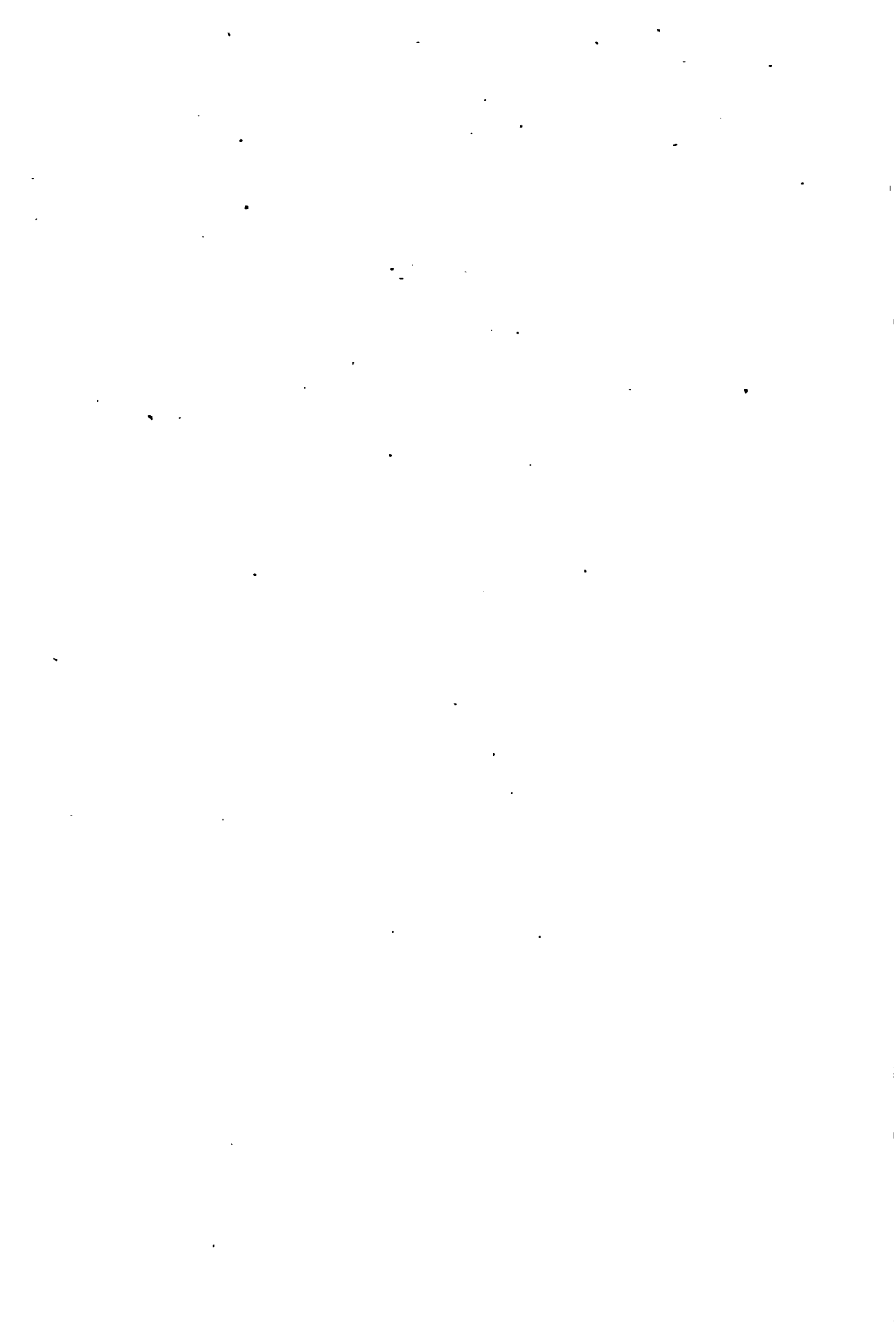
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OFFICE OF THE STATE FORESTER,

MADISON, WIS., Nov. 8, 1906.

STATE BOARD OF FORESTRY.

GENTLEMEN: I have the honor to submit herewith my First Annual Report as required by Section 2, Chapter 264, Laws 1905

Very respectfully,

E. M. GRIFFITH,

State Forester.

REPORT OF THE STATE FORESTER.

WHAT FORESTRY IS.

Forestry is the systematic management of forests to obtain successive crops of timber. One of the most enthusiastic supporters of the forestry movement in this country, because he knows our country so well and appreciates fully the need of forest protection, is President Roosevelt and the following is a portion of what he had to say on the subject in an address delivered before the American forest congress in 1905: "You all know, and especially those of you from the west, the individual whose idea of developing the country is to cut every stick of timber off of it and then leave a barren desert for the home maker who comes in after him. That man is a curse and not a blessing to the country. The prop of the country must be the business man who intends so to run his business that it will be profitable for his children after him. That is the type of business that it is worth while to develop. The time of indifference and misunderstanding has gone by. If the present rate of forest destruction is allowed to continue, with nothing to offset it, a timber famine in the near future is inevitable. Fire, wasteful and destructive forms of lumbering and the legitimate use taken together, are destroying our forest resources far more rapidly than they are being replaced. It is difficult to imagine what such a timber famine would mean to our resources, and the period of recovery from the injuries which a timber famine would entail would be measured by the slow growth of the trees themselves. Remember that you can prevent such a timber famine occurring by wise action taken in time, but once the famine occurs, there is no possible way of hurrying the growth of the trees necessary to relieve it. You have got to act

in time or else the nation would have to submit to prolonged suffering after it had become too late for forethought to avail."

Only a few years ago Wisconsin was one of the greatest timber states in this country and even the lumbermen and woodsmen, who were directly and personally interested in the supply of timber, could not realize that the "pinceries" which seemed so vast would in a few years be a thing of the past. But thousands of axemen were cutting their way on all sides into the great virgin forests and back of them, fed by their "slashings," came the arch enemy fire and completed the devastation, until today, where the great pines once stood, are vast areas of burned over cuttings. These unproductive wastes should be a matter of concern, not alone to the owner and county in which they lie, but to the whole state as well, for forests are crops just as much as wheat or corn and although they take a long time to mature, still, if managed systematically and conservatively, they will furnish annually a supply of mature timber and thus save to the state the many industries which depend upon the forests for their raw material.

The aims of forestry are manifold, but the two most important are to "conserve the forests by wise use and protect the water supply" and, keeping these important points in mind, it is to be hoped that the state will pursue a broad forest policy and gradually acquire large forest reserves which will protect the headwaters of the rivers and important streams. If the state gradually purchases large areas of natural forest land, restocking all denuded areas as soon as the slash is destroyed, it will not only be building prosperity for the future, but can confidently count on receiving a very generous return on the investment in the shape of mature timber.

In this connection it is interesting to know what some of the foreign countries, where forestry is practiced, receive from their forests: Belgium, with only 62,000 acres of state forest, receives a net yearly income of \$155,000; Switzerland, with 94,000 acres, \$124,000; Baden, with 231,000 acres, \$909,000; showing for these countries net yearly incomes of \$2.50 to \$3.90 per acre. The province of Ontario in Canada, where practical forestry is carried out, received a revenue from its forests in 1905 amounting to \$2,800,000. Hon. Andrew White, Forest Commissioner, reports that 7,000,000 acres have been set aside as a forest reserve

and that it contains over 10 billion board feet of white pine. It is not surprising that with such far sighted management, there are no state taxes in Ontario.

In many respects Wisconsin has the same problems of forest protection and incentive for solving them, that New York state had when she organized her department of forest, fish and game some years ago, so that we can profit largely by her experience and will do well indeed if we can acquire such a magnificent forest reserve. The Adirondack forest preserve, as it is called, contains about 1,500,000 acres and the necessity of protecting the forests, and so the water supply, is now so well understood by the people of the state that they are demanding that all the woodlands on the mountain slopes and plateaus be owned and cared for by the state. Also, 800,000 acres are included within private preserves, and as they are splendidly managed, they form an important factor in the preservation of the Adirondacks and at the same time return their owners a good revenue from the sale of the mature timber. There are 27,000 hotels and boarding houses in the Adirondacks and in 1902 it was estimated that 193,000 people went there for recreation and health. In the northern part of Wisconsin we have a wonderful lake region, which even the Adirondacks cannot surpass, and thousands of people go there every summer, so that from this source alone, many of the residents derive a comfortable income. New York state took action in time to save a great region of virgin forest, but Wisconsin must do the best she can with cut-over, burned and swamp lands, which must be very carefully protected from fire and in many cases replanted.

It is one of the tenets of forestry that no land should be held permanently under forests which is more suitable for agriculture, and every parcel of land within the state forest reserve will be examined with this in mind, so that land which is valuable for agriculture may be withdrawn and offered for sale. By such careful selection, the creation of an adequate state forest reserve will in no way retard the development of northern Wisconsin but, on the other hand, the state's forest policy of cutting conservatively, and so always having something to cut, will in a few years give to all the settlers near the reserve, plenty of good paying work during the winter, when it is most needed. Every state has

areas that are not arable and such, but only such, should be held permanently under forests.

STATE FOREST POLICY.

If it was simply a question of the amount of forest land which should be maintained in the state, it would not be necessary to plant, for with proper cutting and care of the young growth, the remaining forests would insure the future. But in order that the state shall eventually reach its highest development, it will be necessary to replant all barren wastes which are only fit for the growth of forests and cut off the forests from the lands which are suitable for agriculture.

There still remain in Wisconsin some splendid forest tracts but, unfortunately, they do not lie in the lake regions, which must be protected on account of being the headwaters of many of our most important rivers, and, even more to the point than location, they are hardwood forests, which in almost every case indicates that their soil will make good farming land.

It is extremely unfortunate for forestry that it is the hardwood forests which have been left until the last, for, although they are particularly well suited for protection from fire, good reproduction, etc., they are also in almost every case well adapted to agriculture and should be used for that purpose. The "pineries" with a sandy soil, which have been cut and burned over, the very rocky lands and certain classes of swamps, will form the future forests and the quicker they are restocked and brought under systematic management, the better it will be for the state.

The state still owns large tracts of swamp land, some with a scattering forest growth, but more open peat swamps, varying in depth from a few inches to 25 or 30 feet. The most profitable utilization of these is an extremely important question and a very difficult one as well, for no two swamps are just alike, and while some can be used for cranberry marshes, are valuable for the peat, or suitable for farming, others are only fit for forest growth. A careful examination will be made of all swamps within the forest reserve, in order to determine what can be done with these large, unproductive areas.

FIRE WARDEN SYSTEM.

The forestry law provides that the state forester shall also be state fire warden and that he shall appoint one or more town fire wardens for those organized towns in which he deems it necessary. The fire wardens have authority to call upon any citizen to assist them in fighting forest fires and both they and those whom they summon receive such compensation as the town board may allow, not to exceed 25 cents per hour. Fire wardens post warning notices, have the power of sheriffs to arrest without warrant, and, most important of all, can absolutely prohibit the setting of any fires during a dangerously dry time.

Over 300 fire wardens have now been appointed, nearly all in the northern part of the state, and they have done excellent work in posting notices, fighting forest fires and by warning the settlers against carelessness in burning brush at all seasons of the year. They are gradually educating the people to the needless and fearful waste of property through forest fires. Over 20,000 forest fire notices, printed both on cloth and cardboard, have been sent out by this office to be posted in railroad stations, post offices, school houses, camps, and along forest roads and trails. Each fire warden is supplied with copies of the forestry law, instructions as to carrying out the provisions of the act, special warning notices, and blanks for statement of services, which must be approved by the state forester before they are paid by the town boards.

Care has been taken to appoint only thoroughly competent, trustworthy fire wardens, without any thought of political preference and, with the exception of their tendency to share the general indifference about fires in young growth and on cut-over lands, the work in posting notices, taking preventive measures and calling out the citizens to fight fire, has been effective. It is most encouraging to report that in several instances forest fires have been extinguished by volunteers, who served without asking any compensation.

Some of the town boards apparently wish to have the appointment given to men in return for political services, as four men who had been appointed after being strongly recommended, attempted, with the approval of their town boards, to grossly over-

charge their towns for posting notices and fighting fires. This is the reason why the forestry law in Sec. 8 provides that, "The town fire wardens shall first submit to the state forester itemized accounts for their own services and the services of their assistants, and no accounts shall be paid out of the treasury of the town in which such services have been rendered without a written approval of the state forester."

It was found that railroad section crews were in the habit of burning piles of ties on the right of way and that many times such piles were left to burn without being watched, so that cases occurred where the fire spread to the adjoining forest. The matter was taken up with the various superintendents and the request made that ties should not be burned until after the first fall of snow and always under careful supervision. This request was complied with and it is a pleasure to state that in every case the railroad officials have been most willing to co-operate with this office to lessen the annual loss from forest fires.

Successful forestry in this state depends to a very large extent upon the solution of the forest fire problem, especially as owners of cut-over lands are beginning to consider the question of planting. The protection that such owners receive for their timberlands, through the fire warden system, is in many cases the only return which they receive for their taxes and it is to be hoped that they will co-operate with this office to make the service as efficient as possible. Upon the whole, Wisconsin has an excellent fire warden system and with competent, energetic wardens and a strong local sentiment to support them, much good can be done.

FOREST RESERVES.

Under the provisions of the present forestry law, chapter 264, laws of 1905, all the state lands north of town 33 constitute the forest reserve. These lands are divided as follows among the several counties:

	Acres.		Acres.
Ashland.....	4,911	Lincoln.....	10,326
Bayfield.....	4,788	Marinette.....	4,783
Burnett.....	25,828	Oneida.....	35,719
Douglas.....	7,029	Polk.....	1,530
Florence.....	3,762	Price.....	27,634
Forest.....	35,636	Sawyer.....	12,317
Gates.....	8,104	Vilas.....	15,142
Iron.....	26,039	Washburn.....	12,497
Langlade.....	2,700		

This makes a total, with fractional acres, of 234,072 acres. The rapid increase in area of the forest reserves in the last two years has been most encouraging. In 1904 the commissioners of the public lands, in accordance with the provisions of chapter 450, laws of 1903 (the first forestry law), set aside as a forest reserve some 40,000 acres in Forest, Oneida and Vilas counties. In May, 1904, the commissioners, upon my request, added some 22,000 acres in Iron county. The legislature of 1905 added to the forest reserve all the state lands north of town 33, and in June, 1906, congress passed Senator La Follette's bill, granting to the state of Wisconsin for forestry purposes 20,000 acres of vacant government land. Thus, in a little over two years, the forest reserves have grown from 40,000 acres to 254,072 acres.

Section 3 of the forestry law provides that "those state lands within said forest reserve which after examination by the state forester are found by him to be more suitable for other purposes than for the purpose of the state forest reserve because of their character, condition, extent or situation, may be sold by the commissioners of the public lands, upon the recommendation of the state forester and with the approval of the state board of forestry." It is one of the tenets of forestry that no land which is valuable for agriculture should be permanently held under forest, the reason being that there is so much land in every country and state which is only suitable for the growth of trees. Therefore, all lands which are found to be suitable for agriculture and those which are so scattered that they will not be useful as part of the forest reserves, will be sold and as provided by law, the proceeds will go into a forest reserve fund "which shall be disbursed only for the purchase of lands to be added to the state forest reserve and for the improvement and protection of said reserve and for the employment of the necessary assistance therefor, by or upon the order of the state forester, with the approval of the state board of forestry."

Already 24,730 acres of land in Burnett, Douglas and Marinette counties, which after examination were found to be either suitable for agriculture or too scattered, have been offered for sale and it is expected that within a short time there will be a considerable fund with which to purchase desirable lands to add to the forest reserve.

In Oneida, Vilas, Iron and Price counties, including 26,000 acres of state lands within the Lac du Flambeau Indian reservation, the state owns over 130,000 acres, most of it being in a fairly compact body. Within this area is one of the most wonderful lake regions in the world and, as they constitute a great reservoir system on the headwaters of the Wisconsin river, they and the surrounding forests should be carefully protected. The destruction of the forests of northern Wisconsin has been on a tremendous scale, particularly on the headwaters of the Wisconsin, and, therefore, a small forest reserve here would fall far short of remedying existing evils. The state should gradually acquire in this region a forest reserve large enough to adequately protect the watershed of this, our greatest river, as such a considerable part of the prosperity of the state is dependent upon its constant, even flow. The tremendous influence which the forest has in preserving and regulating stream flow is explained more fully in the section, "Preservation of Stream Flow." A large enough forest reserve will be able in time to supply many of the important industries which are dependent upon the forests for their raw material. New York state already has a forest reserve of 1,500,000 acres in the Adirondack lake region, protecting the headwaters of the Hudson river, and is steadily buying more timberland.

In Burnett county the state has reserved all its lands along the St. Croix and Clam rivers, the latter being an important tributary of the St. Croix. The St. Croix is an important tributary of the Mississippi river, so that the creation of a forest reserve will assist in diminishing the disastrous floods along the Mississippi. Valuable waterpowers are found along the St. Croix and these should be carefully protected and in time the forest reserves along the St. Croix and Clam rivers will be able to supply a large amount of timber for manufacture in Burnett county. So far as expedient, the proceeds from the sales of lands, timber, etc., in any county will be used for the purchase of other timberlands in the same county.

The state has received the promise of the donation of a considerable area of land along the Brule river in Douglas county and if this is done, a forest reserve will be created in order to preserve the natural beauties of this most attractive stream.

It should always be borne in mind that the main object of the state forest reserves is, first, to preserve the stream flow in our important rivers by protecting their headwaters and, second, to reserve a supply of timber for the important industries which are dependent upon the forests for their raw material.

GRANT OF GOVERNMENT LAND FOR FORESTRY.

The following bill was introduced in congress by Senator La Follette and after considerable discussion on the floor of the house was passed and approved June 27th, 1906:

Public.—No. 304.

An Act granting lands to the state of Wisconsin for forestry purposes.

Be it enacted by the senate and house of representatives of the United States of America in congress assembled, That the secretary of the interior be, and he is hereby, directed to cause patents to issue to the state of Wisconsin for not more than twenty thousand acres of such unappropriated, unoccupied, nonmineral public lands of the United States north of the township line between townships thirty-three and thirty-four north, fourth principal meridian, as may be selected by and within said state for forestry purposes. The lands hereby granted, except as herein provided, shall be used as a forest reserve only, and should the state of Wisconsin abandon the use of said lands for such purpose, alienate or attempt to alienate or use the same or any part thereof for purposes other than that for which granted, except upon consent of the secretary of the interior, as hereinafter provided, the same shall revert to the United States. If it shall be made to appear to the satisfaction of the secretary that any tract or tracts of the land hereby granted are better suited for agricultural than for forestry purposes, or by reason of their isolation are not available for forest reserve purposes, he may by order consent to the sale of such tract or tracts by the state of Wisconsin upon condition that the proceeds of such sale shall be used by the said state in the reforestation of the permanent forest reserves established by said state, and that in event the lands hereby granted shall revert to the United

States the said state will account for all such moneys and will pay over to the United States all sums derived from the sales of these lands and not actually used in reforestation.

Approved, June 27, 1906.

In the discussion before the house the point was emphasized that as the state of Wisconsin was creating forest reserves at the headwaters of the Wisconsin, Chippewa and St. Croix rivers, all of which are important tributaries to the Mississippi, it was assisting in lessening the annual flood damage on that river caused by the rapid destruction of the forests along its course. That the government had spent vast sums in the effort to protect the southern states from the terribly disastrous spring freshets in the Mississippi; that the question was a national one and that therefore it was perfectly just and proper for the government to aid the state of Wisconsin in protecting the forests and so regulating the flow of her rivers. Upon the passage and approval of the act, Governor Davidson requested the commissioner of the land office at Washington to have lists prepared of the vacant government lands north of town 33, so that the state board of forestry could select the 20,000 acres allowed. By July 23rd, the state board of forestry had received from the United States land office at Wausau, township plats showing all the vacant government lands north of town 33, approximately as follows:

	Acres.		Acres.
Ashland	674.97	Mariette	1,700
Barron	40	Onida	3,344.32
Bayfield	6,720	Polk	690
Burnett	4,670.82	Price	2,051.77
Douglas	3,920	Rusk	40
Florence	100	Sawyer	2,468.75
Forest	560	Vilas	2,160
Iron	800	Washburn	1,045.02
Langlade	40		
Lincoln	80	Total	31,435.60

These lands were then platted on a very large forest reserve map of northern Wisconsin, in order to see how they lay in conjunction with the other state lands which had already been set aside for forestry purposes. The isolated and widely scattered lands were first looked over to determine if they were valuable timberlands but in almost every case it was found that all the timber of value had been stolen. All the government lands adjoining or near to the state lands and within the areas where the permanent forest reserves will be located, were selected and in

addition the best of the isolated and scattering lands. The following list shows the acreage of the lands selected in each county:

	Acres.		Acres.
Ashland.....	417.27	Oneida.....	8,404.27
Bayfield.....	780.09	Polk.....	686.40
Burnett.....	4,276.40	Price.....	1,632.69
Douglas.....	1,906.79	Sawyer.....	2,216.90
Forest.....	328.18	Vilas.....	2,031.16
Iron.....	817.14	Washburn.....	937.40
Langlade.....	40		
Lincoln.....	95.00	Total.....	19,998.39
Marinette.....	447.10		

As provided in the act granting these lands, any tract or tracts of land which are better suited for agricultural than for forestry purposes, or by reason of their isolation are not suitable for a forest reserve, may be sold with the consent of the secretary of the interior and the proceeds shall only be used for the reforestation of the permanent forest reserves established by the state. This wise provision will give us in time a very considerable fund for reforesting the denuded and burned over areas within the forest reserves.

SUMMARY OF FOREST FIRES.

Most of the area which was burned within the last two years had been cut over and unfortunately the people have come to look upon fires on such lands as a matter of course and as doing practically no damage unless they are destroying mature, merchantable timber. As a matter of fact, a forest fire in mature timber, provided there is not a bad slash on the ground, injures the timber by burning around the boles of the trees but as a rule does not kill them. Fires in young growth, however, almost invariably destroy a large proportion of the timber and in many cases, as no seed trees remain, the blanks which are formed by the fire are left bare for many years, until the remaining young growth has reached sufficient size to produce seed and thus restock these areas. The following year after mature timber has been cut, the ground is often covered with self sown seedlings and the least fire will kill them, thus destroying all chance for a second crop or else delaying it for many years.

That the people are so indifferent to fires in young growth and on cut-over lands is the most discouraging feature of the forest fire problem in this state, but this feeling must change when they

come to realize the loss, both to the owners and the whole community, not only in young timber but in soil fertility as well. Timber values are now almost double what they were five years ago and are constantly rising, so that only ignorance would feel indifference to the destruction of young timber, and if the owners half appreciated their loss, they would take advantage of the provisions of the law and collect full damages from the responsible parties.

In 1904 there were appointed 249 fire wardens and their annual reports are summarized as follows:

	Appointed.	Reported.	No. fires.	Acres burned.	Cost of service.
Ashland.....	3	3	1	20	
Barron.....	6	4	1	1	
Bayfield.....	8	8	20	10,330	\$336 54
Burnett.....	6	6	4	2,000	
Chippewa.....	10	10		20	
Clark.....	16	12			4 00
Douglas.....	4	3	6	3,760	123 25
Dunn.....	8	7	5	1,420	15 00
Eau Claire.....	8	6	12	700	11 31
Florence.....	3	3	4	60	12 00
Forest.....	6	5	1	80	18 00
Iron.....	5	3	2	200	
Jackson.....	10	7	6	3,800	5 10
Langlade.....	9	7	6	170	25 25
Lincoln.....	8	6			
Marathon.....	20	13	1	1	
Marinette.....	9	7	13	5,280	69 01
Oconto.....	5	4			
Oneida.....	12	10	19	12,740	67 35
Polk.....	18	13	8	4,580	57 50
Portage.....	8	8	3	400	
Price.....	14	10	8	485	16 00
Rusk.....	1	1			
Sawyer.....	2	2			
Shawano.....	17	15	2	120	2 00
Taylor.....	10	5			
Vilas.....	4	3	9	2,210	90 00
Washburn.....	4	4	7	8,300	24 00
Waupaca.....	7	5	1	100	
Wood.....	8	8			1 00
Total:.....	249	198	140	56,777	\$867 20

As will be seen from the following table, by far the greatest number of forest fires, of which the origin could be determined, were caused by settlers clearing land, while the hunters and campers came next but did a relatively small amount of damage; for the settlers not only started most of the fires but were responsible for those which caused the greatest loss.

CAUSE OF FOREST FIRES.

Settlers clearing land.....	21 or 50 2 per cent.
Hunters and campers.....	7 or 17.5 per cent.
Settlers burning for pasture.....	4 or 10 per cent.
Logging crews.....	2 or 5 per cent.
Engines.....	2 or 5 per cent.
Indians.....	2 or 5 per cent.
Pipes or cigars.....	1 or 2.5 per cent.
Lightning.....	1 or 2.5 per cent.
Miscellaneous.....	2.3 per cent.
	100 per cent.

Thus the settlers by clearing land and burning for pasture, caused 60.2% of all the forest fires.

In 1905 over 300 fire wardens had been appointed and a summary of their annual reports follows:

County.	No. of fires.	Acres burned	Amount of timber destroyed.	Other loss.	Cost of service.
Ashland.....					\$ 2 50*
Barron.....	3	2,930	\$300	\$ 200	15 00
Bayfield.....	13	24,160	1,400 M. ft.; 200 car loads; \$300.	1,600	409 00
Burnett.....	8	3,100	30 M. Jack pine.....	Several M. ft. lumber	16 00
Chippewa.....	1				17 50*
Clark.....		100			15 00
Douglas.....	23	10,660	4 to 5 million ft., 200 cds.	2 cattle. Cabin. Fencing.	286 40
Dunn.....	3	4,560	25 to 30 acres timber...	Fencing.....	60 50
Eau Claire.....	6	500		Building. 7 tons hay.	10 00
Florence.....	9	470	1,700 cds.	50 M. ft. logs. 500 cds. 2 log barns.	18 50
Forest.....	3	620	50 M. ft.		45 37
Iron.....					
Jackson.....	10	1,545	Underbrush.....	Fencing.....	8 75
Langlade.....	6	10	Hardwood.....	10 acres marsh...	16 50
Lincoln.....					10 50*
Marathon.....	5	350	Sapling. Young growth...	Fencing ..	7 25
Marquette.....	8	3,505	1,200,000 ft. timber.....	\$8,000. Logs.....	102 25
Oconto.....	5	740	50 M. pine. Cut-over lands	500 ft. lumber...	44 25
Oneida.....	9	2,449	55 M. pine. Small growth.	Fencing. Hay shed.	81 25
Polk.....	13	12,143	25 M. ft. small Jack pine.	330 cds. wood ..	40 60
Portage.....	11	705	Hardwood. Small oak...	\$1,800	
Price.....	5	169	8 M. ft. Birch and Hemlock.		38 50
Rusk.....	2	400	Hardwood. Hemlock....	Logging camp...	11 00
Sawyer.....					63 25*
Shawano.....	2	40	Cedar poles.....		16 68
Taylor.....	3	9	Second growth.....		17 40
Vilas.....	3	100			144 00
Washburn.....	9	6,860	50 M. young Jack pine. ..	Fencing. Pasture	21 25
Waupaca.....					
Wood.....					18 00*
Total.....	160	76,125			\$1,529 70

* For posting warning notices.

It would be an excellent plan if the lumber companies and large timberland owners of Wisconsin would co-operate with the state, as is done in Maine, by appointing and paying their own fire wardens, to serve during the dangerously dry season, and placing them under the direction of the state fire warden, so that the whole system of protection could be systematically organized. One man can patrol 10,000 acres and, as he should be employed usually from about the 15th of May to the 15th of November, or six months, at say \$50.00 per month, the cost would be \$300.00. This would be at the rate of 3 cents per acre, which is surely a low rate of insurance when the value of the property is taken into consideration.

TIMBER TRESPASS.

For many years timber trespass, or the stealing of timber, for some unaccountable reason has been treated most leniently and in Wisconsin both the government and state have suffered enormous losses in this way, so much so that it is exceptional to find a forty, owned by either, which has not been trespassed upon and frequently every stick of merchantable timber has been cut.

The state for many years placed a premium on such thievery, for it was customary to settle with trespassers upon the mere payment of the stumpage value of the timber. This worked as an open invitation for lumber companies and individual loggers, for they reasoned that their chances of being caught were slight and even if they were caught, they would only have to pay what the timber was worth.

Of course, many cases occur where a lumber company cuts over the line unintentionally and in such cases the only thing that can be done is to charge them merely a fair stumpage price for the timber which they have cut.

The hardest persons to deal with are poor settlers, who are not financially responsible and are encouraged to cut timber which does not belong to them by the lumber company to whom they sell the logs. Such settlers are often miserably poor and as the law provides both criminal as well as civil action, the poor man would go to jail while the rich man would escape with the payment of a fine. This, of course, is unjust and therefore the state

board of forestry, at a meeting held April 9th, 1906, passed the following resolution: "That in view of the statement by the state forester that during the past winter there has been considerable trespass on state forest reserve lands, and that as in the past it has been the custom throughout the state to settle with trespassers for merely the actual stumpage value, and as such procedure has tended to encourage trespass, therefore, it is resolved by the state board of forestry that hereafter the board will ask the district attorney of the county in which the trespass is committed, to bring criminal action in addition to such damages as may be collected under the civil liability for forest trespass."

This means that in the future both criminal and civil action will be brought against all persons who commit willful timber trespass on state forest reserve lands, rich and poor alike, and it is believed that one or two prison sentences will do more to put a stop to this custom than any number of fines. The law in regard to criminal action is as follows:

"Criminal Action; forest trespass. Section 19, Chapter 264, Laws of 1905. Every person who unlawfully and willfully cuts, injures or destroys any kind of wood or timber standing, lying or growing upon the lands of another, or of the state, or of the United States, or upon any public highway, or unlawfully and willfully injures or destroys or carries away any of the products of such wood or timber lands, is guilty of a misdemeanor, and upon conviction shall be fined not less than \$25 nor more than \$1,000, or be imprisoned not less than fifteen days nor more than three years, or by both such fine and imprisonment."

The law in regard to civil liability is as follows:

"Civil liability for forest trespass. Section 20, Chapter 264, Laws of 1905. In addition to the penalties provided in section 19 for willful trespass on forest lands, the state, the county or the private owners, upon whose lands the willful trespass was committed, may recover in a civil action double the amount of damages suffered. This section shall not apply to the cutting of wood or timber from uncultivated woodland for the repair of a public highway or bridge upon or adjacent to the land."

In the five months from May to October, 1906, the sum of \$4,815.02 has been collected for timber trespass on state forest reserve lands, committed either by lumber companies or settlers logging for them. This timber was cut during the winters of 1904-05 and 1905-06, and in every case where the trespass was willful, double the market price of the stumpage has been

charged. Thus, if white pine was cut worth \$12. per M, the trespasser has been obliged to pay \$24. per M, or if it was tamarack worth \$7., then \$14., etc. So far, legal action has not been necessary, as the trespassers could not deny that they had cut the timber, and were willing to settle out of court, but in future, as stated, both criminal and civil action will be brought.

Many of the largest and best lumber companies in the state are becoming more and more interested in the subject of forestry and they are co-operating with this office in putting a stop to timber trespass on forest reserve lands. The man who deliberately steals timber is gradually coming into his own, and is looked upon as twin brother to the horse thief.

STATE LANDS WITHIN INDIAN RESERVATIONS.

Under the swamp land grant of 1850, Wisconsin was granted all the swamp lands within the state which were owned by the federal government. Among the lands so granted were thousands of acres within what are now the Indian reservations, but these reservations were not set aside and ceded to the Indians until 1854. Clearly, then, the state would seem to have the prior and undisputed claim to these lands and yet the department of the interior holds that while the title appears to rest in the state, the Indians have the possessory right so long as the reservations remain intact and they even go so far as to contend that the right of possession carries with it the right to use the timber on these lands for their own use or to sell it.

Under the state forestry law of 1905, all state lands north of town 33 were set aside as a forest reserve and therefore all the disputed lands within the Lac du Flambeau, Lac Courte Oreille and La Pointe Indian reservations come under the control of the state board of forestry. The state would probably not object to the Indians using these lands as much as they pleased for hunting, camping, etc., but cutting the timber for their own use or selling it, is quite another matter. The action of the government in this matter is most unjust, both to the state and to the Indians as well, for the lands were clearly given to the state in 1850 and then included in reservations which were given to the Indians in 1854. But it should be remembered that these lands

were first given to the state, that hers is the prior claim and that the government should recompense the state for the land, which it had no right to cede to the Indians.

Nor is the matter a small one, for the lands within the Indian reservations which were granted to the state in 1850 comprise the following acreage:

Menominee Reservation.....	16,378 acres.
Lac du Flambeau Reservation.....	20,666 acres.
Lac Courte Oreille Reservation	1,400 acres.
La Pointe Reservation	8,559 acres.
Total	47,003 acres.

As a large part of these lands is still heavily timbered, they are worth considerably over one million dollars. I would most strongly recommend that at the next session of the legislature a bill should be passed providing that in case the state was fully recompensed by the government, the state would relinquish all claim to these lands, and that the amount so received from the government should be used exclusively for the purchase of lands to be added to the state forest reserve. In this way the state would have a large sum with which to purchase lands so as to consolidate its forest reserves and the Indians would receive what in justice should be theirs, though the government had no right to cede it to them in the first place.

CO-OPERATIVE WORK ON THE INDIAN RESERVATIONS.

Through an agreement between the department of the interior and the forest service of Washington, D. C., on the part of the federal government and the state board of forestry on the part of the state, it has been arranged that the forest service should have charge of the sale and cutting of timber on all Indian reservations and that the state board of forestry should co-operate in this work in Wisconsin. The forests on the Menominee, Lac du Flambeau, Red Cliff, La Pointe and Lac Courte Oreille Indian reservations comprise some of the finest which are left in the state, especially on the Menominee reservation, and it is to the interest of the state to see that the timber is cut carefully under forestry regulations.

The Menominee reservation has not been allotted to the individual Indians but is owned by the tribe. The Indians do their

own logging, selling the logs to the highest bidder after they have been banked on the drivable streams, and it is to the interest of the whole tribe to see that the cutting is done conservatively and carefully, so that they will not only receive the highest possible revenue from their valuable forests, but also protect them for future cutting. It is a difficult matter, however, to make Indians cut as carefully as they should, though the work has shown an improvement in the last few years.

It can be safely said that the forests on this reservation are the finest in the state and as they are at the headwaters of the Wolf river, they are important in conserving a uniform stream flow and also in supplying industries in that part of the state with their raw material. Gradually, forestry regulations should be introduced in the logging operations and only the mature, ripe timber, of which there is an enormous amount, should be cut, the slash piled and burned to prevent forest fires, and the cuttings so arranged that the growth and reproduction of the most valuable species will be favored.

Up to the present time only pine and hemlock have been cut, as all logs had to be driven, but now two railroads are building across the reservation and therefore, even if sawmills are not built, there will be a ready sale for the fine hardwoods which predominate in the western portion. As the Indians log their own timber, there is every reason why they should use the most careful forestry methods, for, properly managed, their forests will always be of great value both to the tribe and the state.

On the Lac du Flambeau reservation there was originally a fine stand of timber but the lumbering operations were fearfully wasteful, with the inevitable result that forest fires followed and destroyed as much, if not more, than the contractors cut. Under the new contracts and since the co-operative work was arranged, the contractors have been obliged to pile and burn the slash and thus it is hoped that a large amount of young timber in the southern and western portions can be protected.

The soil on this reservation is very sandy, unsuitable for farming and therefore there is the more necessity that the forests should be carefully protected, so that the Indians may be able to support themselves by means of their lumbering operations. The Lac du Flambeau reservation embraces a number of large

lakes which are important feeders of the Wisconsin and Chippewa rivers, so that the safeguarding of these reservoirs through the proper management of the forests is an all important matter to the state.

The Lac Courte Oreille reservation was very heavily cut and burned over in past years, especially in the western and northern portions but as the old cuttings were confined to pine, there remains a large amount of hemlock and hardwoods, the heaviest stands being in the southern and eastern portions. Under the terms of the new contracts, the contractors are not allowed to cut any white or Norway pine under 10 inches in diameter, the idea, of course, being to protect the young pine until it reaches mature size. There is also a clause in the contracts which provides that no unnecessary damage shall be done to the young growth by the lumbering operations but unfortunately no provision is made for burning the slash and as a result, the young growth is very liable to be either seriously injured or totally destroyed by forest fires.

The soil is much like that of the Lac du Flambeau, namely, sand with little or no clay, which is very unproductive and not at all suitable for farming. Therefore, the protection of the forests for future use is all important. The Lac Courte Oreille reservation also embraces several large lakes, which are important feeders of the Chippewa river.

The La Pointe reservation contains, next to the Menominee, the largest body of timber on any reservation in Wisconsin. It was heavily cut over in past years for the large pine, but there is still a fairly heavy stand of small pine, hemlock and hardwoods, with scattering spruce, tamarack, cedar and balsam. The present contracts provide that the contractor shall pile and burn the slash and the new contracts will stipulate that the forest service shall mark all the timber which is to be cut, so that the small, immature trees, especially the pine, which at present are being cut, may be saved.

Much of the soil on this reservation is a good clay, suitable for farming, and as there are large sections from which the timber has almost entirely disappeared, through heavy cutting followed by fire, the Indians have an excellent opportunity to make some good farms. But, as anyone can testify who has become ac-

quainted with them, they do not seem to have any faculty or taste for farming, but are more inclined to work in the woods than anywhere else.

The Red Cliff reservation has been so heavily cut over that only a small amount of hardwood and cedar remains, but the soil is a good clay and therefore, after the lumbering operations are completed, the land will be of considerable value.

It is the plain duty of the government, as guardian of the property of the Indians, to see that the timber on the reservations is cut as carefully as possible, so that the Indians will always have work and a steady income from the lumbering operations, and the state should assist as much as possible, for the protection of the stream flow and a steady supply of raw material are both extremely important.

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STATE PARKS.

Section 4a of the forestry law provides as follows: "The state board of forestry shall visit points of natural interest in the state and examine into and consider the propriety and desirability of securing such places as public parks. Said board may further investigate as to the price and report its conclusions to the next session of the legislature." After the forestry law was passed, the legislature also passed another law providing that the governor should appoint a commission consisting of three members to examine and report upon the desirability of acquiring Devil's Lake and the Dells of the Wisconsin as state parks and Governor La Follette appointed me as one of the members of the commission. The state park commission have made a number of trips to Devil's Lake and the Dells of the Wisconsin and will make a report to the governor in regard to them, and I have also, in connection with my work as state forester, vis-

ited other points which had been recommended as well suited for parks, but have found that there are very few places, at least in northern Wisconsin, which are at all suited for parks, but many, notably wild timberlands around beautiful lakes, which should be included within the forest reserves.

In fact, a state forest reserve is in many respects a state park but it is very seldom that a state park can also be considered or managed as a forest reserve. Wisconsin already owns an interest in one park, the Inter-state park at the Dalles of the St. Croix, 300 acres of which is owned by Minnesota and 600 acres by Wisconsin. It is a beautiful spot, wonderfully well suited for a state park but unfortunately it is on the extreme western side of our state and not easily reached. But it is well that Wisconsin co-operated with Minnesota in securing this park in time and as the population of the state increases, it will become of more real value.

Devils Lake and the Dells of the Wisconsin are very centrally located, are most beautiful spots and the legislature should see to it that they are protected for all time for the people of the state.

LECTURES ON FORESTRY.

As the practice of forestry in this country is comparatively recent, it is important in starting the work in a new region to educate the people to a correct understanding of the subject, so that they may realize how important it is to the welfare of the state that the forests should be protected through careful use and that forestry is really conservative lumbering and in no sense horticulture or landscape gardening, as is so often the general impression.

During the winter of 1905-06 I delivered a number of lectures on forestry, both in a regular course at the university and also before various clubs and associations in a number of the larger cities of the state. Over forty students took the course at the university, which was confined to the fundamental principles of forestry, sixteen lectures being given, covering a period of eight weeks. Several students who attended had decided to take up forestry as their life work; others from the college of

agriculture wanted to study the best methods of managing wood lots in connection with farming; while others expected to go into lumbering.

From various sources the suggestion has been made that a forest school should be established at the university. I feel, however, that it would be unwise to do so at this time, as there are now a number of first class forest schools in this country, which are fully able to train all the foresters that there is any demand for at present. Lectures given throughout the state, especially when illustrated with lantern slides showing the exact difference between the ordinary methods of lumbering and forestry, do a great deal of good, as they educate the people to a realization of the great need of forest protection in this state.

ASSISTANT STATE FORESTER.

On May 16th, 1906, Mr. F. B. Moody, having passed the state civil service examinations, was appointed assistant state forester. Mr. Moody was born in New Portland, Maine, in 1879, his father being a lumberman, and he has always been accustomed to work in the woods, having cut timber, driven logs on the rivers of Maine, estimated and scaled timber and helped in its manufacture. First he graduated from Bates University, then entered the school of forestry at the University of Michigan, from which he graduated in 1906. He has had two field seasons with the government forest service and passed the United States civil service examinations in forestry.

During the past summer Mr. Moody has devoted all of his time to field work on our state forest reserves and in co-operative work on the Indian reservations. He has proved both capable and trustworthy and in future will have direct charge of all work in the woods.

PRESERVATION OF STREAM FLOW.

Many people do not understand in just what way forests preserve and regulate stream flow, and they imagine that it is brought about largely through the influence of forests in causing and increasing rainfall. In the arid plains, where for months the soil is parched dry, the cooling influence of great

bodies of forest have unquestionably a slight effect in causing rainfall. But in Wisconsin, surrounded as we are on the east and north by great lakes, the influence of the forest in causing or increasing rainfall is probably so very slight that it need not here be taken into consideration. However, everywhere and under all conditions, the forest acts as a great sponge in holding moisture and giving it off gradually, thus saving forested countries from the disastrous effects of floods at one season and low water at another. Anyone who will go into the dense forest in early spring will find the snow melting slowly when it has long since disappeared in the open country. The melting snow and the falling rain in the forest, work down slowly through the humus and soil and are carried by the roots to some depth, often to underground channels, to appear weeks or months later in the form of springs or in small streams. Thus, streams which rise in forested regions have a fairly even flow throughout the year, while others, rising in regions where the timber has been destroyed, have violent floods in the spring while the snows are melting, or during a rainy season, and shrink to a mere trickle of water during hot, dry months.

This most important function of the forest in regulating stream flow is so well known in foreign countries, where the forests have been intelligently managed for hundreds of years, that in many sections the owner of forests on an important watershed is prohibited by law from clean cutting it. He is allowed to cut conservatively under the advice and management of the forestry department, but it is wisely held that no person has the right to destroy forests on an important watershed, thus causing floods and jeopardizing the property of so many others.

In this country the most careful records have been taken for ten years of stream flow in forested and non-forested watersheds in the San Bernardino mountains of California, and the results are most interesting, as will be seen from the following tables.

**ANNUAL RAINFALL AND RUN-OFF ON FORESTED AND NON-FORESTED
CATCHMENT AREAS IN THE SAN BERNARDINO MOUNTAINS, CALIFORNIA.**

Area of catchment basin.	Condition as to cover.	Precipitation.	Run-off per square mile.	Run-off in percentage of precipitation.
Sq. miles.		Inches.	Acre feet.	Percent.
0.70	Forested.....	46	731	28
1.05	Forested.....	46	758	30
1.47	Forested.....	46	904	36
.53	Non-forested.....	33	1,192	69

It will be noted from the above that the run-off in the non-forested basin was 69%, while in the forested basins it was only from 28 to 36%, a tremendous gain for the streams protected by forests. But still more instructive is the following table:

**RAPIDITY OF DECREASE IN RUN-OFF AFTER THE CLOSE OF THE RAINY
SEASON.**

Area of catchment basin.	Condition as to cover.	Precipita- tion.	April run-off per square mile.	May run-off per square mile.	June run-off per square mile.
Sq. miles.		Inches.	Acre feet.	Acre feet.	Acre feet.
0.70	Forested.....	1.6	153-	66-	25-
1.05	Forested.....	1.6	145-	70-	30-
1.47	Forested.....	1.6	166-	74-	30-
.53	Non-forested.....	1	56-	2-	0

This table shows the wonderful influence that forests have in regulating and sustaining stream flow. The second month after the rain had ceased to fall, the forested areas were giving off from 66 to 74 acre feet and the non-forested only 2. In June, three months after the rain had ceased to fall, the forested areas were still showing from 25 to 30 acre feet, while the flow from the non-forested area had entirely ceased.

The water powers of our rivers are one of the most valuable assets of the state but, as can readily be seen, unless the forests at the headwaters of these rivers are protected, the melting snows in the spring will cause freshets for a few weeks and then during the summer months the water will be so low that mills using water power must either shut down entirely or else run only a portion of the time. The development of the water powers of Wisconsin is in its infancy and as the lumber industry dies out and we look

more and more to manufacturing, all water powers, large and small, will become increasingly valuable and the necessity of protecting them more apparent.

At present, some of the water powers of our most important rivers give a relatively even power only from the fact that at the headwaters dams have been constructed at the outlet of the lakes, so as to store the spring freshets until the summer months when it is most needed. But this is only a temporary makeshift and it will readily be seen that it is very unwise to allow a few companies owning dams to thus virtually control all the water powers on any river. The systematic control of these important matters, for the benefit of all, is purely a state function and, as previously stated, is the first point to be considered in the forestry work of this state.

NATURAL REPRODUCTION.

The statement is often made that pine will not follow pine, and that when the old pine is removed, poplar or aspen usually comes up. The latter is true but it does not mean that pine will not follow pine, but simply that the repeated forest fires following lumbering operations, destroy all the pine seed and the young seedlings. Surrounding old burns are covered with poplar or aspen, their seed is very light, often being carried for miles by the wind, and, as a result, burned country is nearly always covered by these species. But where fire does not follow lumbering in the pineries, the young pines come up readily and often the reproduction is magnificent.

It is only a question of putting a stop to the forest fires and, therefore, foresters have made so much of the vital importance of piling and burning the slash, the neglect of which has been the direct cause of the destruction of millions of acres in the northern part of the state. As stated in another section, the Government forest service and lumber companies have found that in many parts of the country and under widely varying conditions it costs to pile and burn the slash from 12 to 25 cents for each thousand feet of logs cut and removed.

If two or three trees per acre, which, on account of being crooked or limby would yield only one or two logs of any value,

are marked and left for seed trees, and the slash piled and burned. the cut-over land will soon be covered with young growth and there will be little if any necessity of planting. In this respect, in many sections of northern Wisconsin, chance has accomplished just what the forester would strive for. Early in the lumbering operations only the best trees were taken and those that were left acted as seed trees; the slash was either largely consumed by early fires or else it rotted down in sections that were protected by surrounding lakes or adjoining cleared or burned over land. As a result of such fortunate conditions, thousands of acres are now well stocked with a fine stand of young timber.

Examples of particularly fine stands of second growth white pine and Norway coming up on cut-over land, are to be found in every county and are unusually noticeable in the northern part of Lincoln county near Tomahawk, on the Flambeau Indian reservation in Vilas county, near Grand Rapids, on the Menominee Indian reservation in Shawano county and in many other sections of the state, proving that Wisconsin can in a great measure regain her wonderful forests by means of common sense rules in lumbering and protection from forest fires.

Lumbermen and woodsmen, as a rule, do not notice young growth, especially seedlings four or five inches high, for they are accustomed to look only for merchantable timber and the young growth has usually meant nothing to them but a hindrance in logging. Such men see thousands of acres covered with poplar, aspen, birch and cherry and take it for granted that this is the only growth which is coming up on the land. But if they would take the pains to walk through this advance growth, which is really nothing more than fire weed, they would find in many cases great numbers of young pine, all the way from little seedlings to trees 10 and 12 feet high. Nature has provided species in the aspen, poplar, birch and cherry which can quickly reclothe burned over land and, after acting as a nurse to the valuable pine that comes up under its shade, die down, having performed their function.

Fortunately, the white pine, which is our most valuable timber tree, has a very strong power of reproduction, more so than the Norway with which it comes into direct competition. The following species all reproduce themselves well and if a few seed trees are left when the mature timber is removed, very little plant-

ing will be necessary to secure a second crop: white and Norway pine, Jack pine, cedar, tamarack, soft and sugar maple, birch, basswood, elm. The following species reproduce themselves only fairly well and must be given a start or protected from the other species, or they will be crowded out: hemlock, spruce, balsam, red and white oak, ash, butternut and hickory.

Where hemlock occurs in a mixed forest and the other mature timber is cut, roads built, etc., the mature timber is seriously affected by the changed conditions, especially the sudden addition of light, as its root system is very sensitive and, as a result, a large number of the trees die. But the hemlock reproduces itself fairly well and the young growth coming up in more or less of a pure stand and becoming accustomed to a considerable amount of direct sunlight from the beginning, is not nearly so sensitive and will grow to maturity. This can readily be seen in the forest, for it is the old trees which have grown up under dense shade that so easily succumb when the surrounding trees are removed.

REFORESTATION.

Reforestation must play an important part in the forestry work of Wisconsin, for much of the state land which constitutes the forest reserves has in many cases not only been cut over but also repeatedly burned until it has been left almost a waste, without any young growth coming up. However, until the reserves can be consolidated, fire lines cut and rangers regularly employed, it will be a dangerous experiment to plant lands that are covered with old tops, brush, etc., and are liable to be burned over at any time. The large number of lakes within and surrounding the main forest reserves will be of great assistance in dividing the timberlands into compartments, so that a forest fire can often be held to the one it originates in. Fire lines, which are broad strips cut through the forest and then burned over, can be run from lake to lake, so that they will, with the lakes, form a barrier around tracts of timber and keep out all forest fires. Of course, there are lands which have been burned over so heavily that all the old slash has been consumed and there is almost no fuel for a fire to feed upon. Such lands could be planted but the first work should be done in the main forest reserves, when they have been

brought into compact shape and can be systematically guarded and protected. When the time arrives for the state to commence planting operations, I would recommend that one or two large nurseries be established and that the state should sell plants at cost to lumbermen, timberland owners, farmers and others who may wish to reforest their lands.

To those whose land is in proper condition for reforestation, the following may be of interest and benefit. As a general rule, planting will be found to be much more satisfactory than sowing, and this is especially true where mixed woods are to be formed, as, with plants, the exact mixture desired can be secured easily. The results from broadcast sowing are apt to be very disappointing except on fairly well cleared and prepared land, as on brush covered land only a small portion of the seed reaches the soil. Where a large amount of planting is to be done, a nursery should be started in order to reduce the cost of the plants to as low a figure as possible.

In 1903, the forest, fish and game commission of New York state started their first planting operations and put out 500,000 seedlings on one tract, the following species being used: white pine, Scotch pine, Norway spruce, Douglas fir, European larch and black locust. "It required 747 days labor, including foremen, laborers and water boys, to set out the 500,000 seedlings, or 669 plants per day for each man and boy on the job. The total expense of the plantation, including purchase price of seedlings, cartage on same and labor, amounted to \$2,496.22, or less than half a cent per plant. The seedlings having been set out at intervals of six feet, there were 1210 plants per acre and hence the ground actually occupied by the half million seedlings includes only 414 acres. But owing to frequent obstructions, swampy places and thickets of sapling trees, the boundaries of the territory planted embrace nearly 700 acres." The New York state commission bought these plants and the cost was considerably more than it will be now that they have their own nurseries.

WASTE IN LUMBERING.

Only a few years ago, when the forests seemed inexhaustible to the lumbermen, they were extremely wasteful, taking only the

finest trees and leaving all logs which were not straight and clear to rot in the woods. As a natural consequence of leaving such an enormous amount of slash on the ground, fearfully destructive forest fires were the rule rather than the exception, so that in nearly every case the smaller timber which was not at that time merchantable, was destroyed and it is doubtful if 40% of the standing timber was utilized. The state as a whole thus lost millions of dollars, for the timber which was wasted and destroyed would now be worth more than the original cut.

Today, when the remaining forests are so valuable, wasteful methods in lumbering are inexcusable, not only from a technical but from a financial standpoint as well, and yet such waste is going on constantly in many parts of the state. As a rule, such waste does not now occur in logging pine, for the lumbermen are picking up the old, burned logs which were left in former operations, defective trees and are even recovering logs which sank in the rivers and lakes; in fact, in every way are saving the little that they can from the former great waste.

But within the last few years, they have begun to cut hemlock on a large scale and, although they are cutting closer than when they first began to operate on pine, still, in the aggregate, the waste is enormous and as the supply of hemlock is very limited, the shortage will come within a very few years and seriously affect not only the lumber industry but still more the tanneries and especially the paper mills. Pine is valuable only for its lumber but hemlock, though an inferior lumber, is extremely important as a pulp timber and its bark a staple for tanning. The paper mills of this state use annually about 100,000,000 feet of hemlock, that wood comprising 50% of the total consumption and as the state has only an insignificant supply of the only other woods which are suitable for pulp, spruce and balsam, it is of the greatest importance that the hemlock should be protected and used as economically as possible. The great supplies of hemlock in Pennsylvania, upon which the tanneries of this country have depended very largely for their supply of bark, have almost entirely disappeared, so that what we have in Wisconsin is doubly important.

Spruce, balsam, poplar and hemlock are the only trees which are used to any extent in the manufacture of paper. Poplar was

tried successfully, but the supply is too limited to influence the industry; some fairly good pulp has been made from Jack pine, so that this wood may form part of the future supply, but extensive experiments have failed to show that any other species can be used. This being so, it would seem the wisest plan to have the spruce, balsam and particularly the hemlock, used only for the manufacture of paper, but at present most of the hemlock is sawed into lumber and in many cases the tops and defective butt logs, which would make good pulp, and all the bark, are left in the woods and wasted.

A few years ago, it was not uncommon to see oak tanned leather, but the supply of oak bark was rapidly exhausted and today most of the hides are tanned in an extract made from hemlock bark. The supply of hides is in the east principally, on account of the great stockyards being in Chicago, and as the supply of hemlock in the east is very limited, the tanneries in the near future will probably have to ship the extract of hemlock bark from the Pacific coast. This being so, the supply of hemlock bark in Wisconsin should be carefully harvested on account of its increasing value, but as a matter of fact, there is a very small amount of bark peeled.

It is the rule rather than the exception that the owners and managers of lumber companies devote most of their time to the saw-mill and office, and the work in the woods is left to the walking boss and camp foremen and as a consequence, it is doubtful if there is any other large business where the quality of the work varies so tremendously as in logging. Some foremen watch the crews carefully and see to it that the stumps are cut low, the timber run well up into the tops, that all logs, skids, etc., are picked up, lay out their roads well and do as little damage to the young growing timber as possible. Others, perhaps working on the same tract of timber, are exactly the opposite, allow the crews to cut as they please, which means an enormous amount of timber wasted in the stumps and tops, that only the best butt logs will be taken, and everything else smashed or allowed to rot in the woods. Of course, where the slash is not piled and burned, the lumbermen know by experience that severe fires are almost sure to follow and, therefore, it is useless to save the young timber. Granting this, there is all the more reason why everything should

be cut and removed which will pay a profit. But to utilize only from 60 to 70% of the merchantable timber and then expect the remainder and all the young timber to be destroyed by forest fires, is by no means good business, to say nothing of the lasting damage that is done to the whole state.

The foremen and the men in the logging camps neither appreciate nor care very much about the wonderful rise in timber values within the last few years, which has made possible the closest utilization of timber, which a few years ago would never have been thought of. But the manager does, or should, know and he should be able to appreciate the loss that is sure to follow when he employs an old time foreman and then allows him to cut as he pleases.

As repeatedly stated, unless the land is valuable for agriculture, it is folly in Wisconsin, with the prevailing prices for stumpage and which are certain to advance, to fail to pile and burn the slash and thus save the young timber, and yet even where this is done, the lumbermen often waste just the timber they are working to save. For example, a lumber company limited the diameter to which they would cut and burnt all the slash in order to save the young growth but they allowed the crews to cut thousands of straight, clean, young white pine for corduroy and car stakes, and yet there was any amount of almost worthless young growth, which it would have been a decided benefit to remove from the forest, which could just as easily have been cut for corduroy, and the car stakes should have been sawed at the mill from inferior material.

The hardwoods of Wisconsin have lately come into great demand and are increasing rapidly in value and as it is much more difficult to avoid waste in logging hardwoods than pine, it is to be hoped that the lumbermen will adopt more modern methods and utilize everything that is profitable.

In 1900, speaking of the erection of factories for making barrel staves and wood alcohol, the forest preserve board of New York said: "These two industries are associated in each case, in order that the entire product of the land may be utilized, the larger timber, including all the hardwood timber, being used for staves, while the cordwood and smaller material is used in the retorts of the "acid" or "wood alcohol" factory. There is no tree so small

but that it is cut, as the smallest limbs will furnish fuel for the fires under the retorts. As a result, the cutting for these factories ends in a complete denudation of the tract, everything being taken, even to the small saplings, which are split into barrel hoops. Nothing is left but a stump field, strewn with the dead brush from the twigs and tops."

The forest preserve board were buying from the lumber companies their timberlands after the mature timber had been cut and naturally they were averse to having the land so denuded of all young growth. Also, farming in the Adirondacks, on account of its cold northern climate is carried on to a very small extent and, therefore, even where there was a good soil, it was a wrong policy to destroy all timber. But in northern Wisconsin, good farms are being made wherever there is a suitable soil and therefore, where timber is being logged on land really suitable for agriculture, it would be a great saving if the owners would adopt more intensive methods instead of allowing so much valuable material to be totally destroyed by forest fires.

In New York, New Hampshire, Maine and Vermont, white birch is very generally cut for spools and the industry has become one of considerable importance. In 1902, the forest commissioner of Maine said in his report: "White birch is used largely by the hardwood novelty mills of the state, yet its greatest utilization is in the manufacture of spools. The spool factories of Maine annually produce about 800,000,000 spools, valued at more than \$1,000,000. Besides being used in the production of spools, much white birch is cut into spool bars for shipment to Europe. Other hardwoods are used to a greater or less extent in the manufacture of small articles, but the consumption of white birch leads the field in this particular line."

In the New England states some lumber companies utilize the tops by making kindling wood in their mills, which is then shipped to the large cities and usually retails at two bundles for five cents. This is especially valuable where the cutting is limited so as to secure future crops of timber, for the large tops, particularly in hardwoods, which would be a source of continual danger in case of forest fires, are disposed of at a profit.

The lumbermen and timberland owners of Wisconsin should bear in mind that the state is becoming settled, that even northern

Wisconsin is no longer a string of lumber camps, and that, therefore, the small remaining tracts of timber will increase steadily in value and should be managed conservatively and intensively and not slashed over as in the past. The forests of Maine and New York are paying a higher rate of interest than ever before, for the reason that the demands for timber, both in old and new channels, are increasing every year as the population and modern business demands increase. The owners of timberlands in these states quite generally have steady incomes from their properties, as they have come to appreciate, through experience, that it is a penny wise and pound foolish policy to try to secure all the returns in one cutting, thus wasting so much young timber, but rather to cut conservatively every ten or twenty years, removing only the mature timber and at the same time improving the forest as the stumpage values rise.

Timberland owners do not get the best returns in new countries where there is a vast amount of virgin forest, but rather after the country becomes settled and timber scarce. Wisconsin is now in that condition and, therefore, the old, reckless methods of lumbering when there were vast stretches of unbroken forest are inexorable and if persisted in, will mean that in a few years Wisconsin will be obliged to import all but the most inferior grades of lumber.

FORESTRY FOR THE CORPORATION.

The main reasons why it will pay the individual to practice forestry are stated in a following section, and the same reasons and others apply much more forcibly in the case of a corporation owning timberlands. Let us, for example, consider the case of a large paper mill, lumber, furniture or leather company, which is dependent upon the forest for its raw material, either in the shape of logs, pulpwood or bark. In the first place, such a company or corporation is often dependent upon one or more water powers for running their mills and they should, therefore, own as much timberland as possible on the headwaters of the river from which they are drawing their power, so as to insure that their waterpowers will be even and constant at all times of the year. And

this, as elsewhere stated, is one of the most important functions of forestry.

Then, a corporation must of necessity look to the future much more carefully than an individual, for they expect to carry on their business for a long term of years if not indefinitely. Therefore, as a constant and sure supply of raw material is all important to a corporation, they should acquire as rapidly as possible a large enough area of timberland so as to supply their own timber from the yearly growth and thus place their business upon a permanent basis as far as the raw material is concerned.

Such a corporation should, first of all, employ a forester to make a careful study of the forests, the rate of growth, power of reproduction, etc., and to determine how much should be cut each year, based upon the annual growth and the area of timberland. For example, let us say that over a large area we find that each acre on the average will produce 50 board feet of timber per year and our mill requires 20,000,000 board feet per year. Then by simple division we find that we must own 400,000 acres of timberland, to place our cutting upon a permanent basis. This is simply the theory of a sustained yield but, of course, in actual practice we would not cut over the entire area in any one year but would cut all the mature timber over a large enough area each year to give us our 20,000,000 feet. The forester, after studying the rate of growth, would be able to determine the diameter to which each species should be cut so as to insure the best future growth and also the most favorable financial return upon the capital invested. As a rule, all trees of any one species, above the diameter determined upon for that species, would be cut but it would be preferable to have a forester mark the trees to be taken, for in some localities trees above the diameter should be left for seed and in others, perhaps, some below the diameter could just as well be removed. This can easily be done by a forester and axeman, working ahead of the cutting crews, and though a hard and fast diameter limit can be held to, still better results can be secured if the varying conditions are given consideration by having the timber marked. A corporation looking to the future and knowing perfectly well that the price of timber will increase, cannot afford to cut so as to destroy its holdings.

The lumber mills have been in the habit of moving from one part of the country to another as the supply of timber was exhausted, leaving devastation behind them, but the time has come when it is getting more and more difficult to find virgin fields to jump to and the lumberman of the near future, if he wishes to continue in business, will have to cut conservatively and so place his business upon a permanent basis. However, to build a lumber mill only requires a relatively small capital and as it can be located and run almost anywhere, irrespective of waterpower, it is in its nature somewhat migratory. But a large paper mill requires a very heavy outlay to build the mill, for machinery and for a large and valuable waterpower. Thus, the locations for paper mills are both limited and fixed, and when a valuable water power has been acquired and the mill built, the question of a sufficient and lasting supply of pulpwood within a reasonable distance, becomes all important. Therefore, the paper mill companies should be the first to see that forestry is particularly well adapted to their business, as it will insure them a steady supply of raw material. Then, too, in cutting pulpwood the timber can be more completely utilized than when only saw logs are taken. It is especially important for a paper mill company to own as much of the timber as possible on the headwaters of the stream upon which their mill is located, so that they may protect their water power.

Many of the above arguments apply equally well to a company manufacturing furniture or wooden ware, for their business is such that they need not be anywhere near as wasteful in cutting timber as a lumber company and, as their demands upon the forest are relatively small, they can easily place their work upon a permanent basis.

At present, most of the large leather companies in this country tan their hides with an extract made from hemlock bark, and in order to insure their supply, many of them own large tracts of timberland. Hemlock is what they want and, therefore, they should cut so as to favor the growth of hemlock as much as possible, but as a matter of fact, their lumbering operations are usually carried on with apparently no thought for the reproduction and future growth of hemlock.

Forestry is a good, practical business proposition for anyone who wants an unusually safe long time investment and therefore

it is more suitable for corporations, who are always looking well into the future, than it is for the average individual.

FORESTRY AND THE RAILROADS.

It is only within the last few years that the railroads of this country have begun to seriously consider the subject of forestry and they have come to it through necessity, as it is increasingly difficult for them to secure the timber which they need, especially cross tie timber. In order to have good and safe tracks they must have good ties and the demands upon the forests for this one item alone are enormous. Mr. Howard Elliott, president Northern Pacific Railway, states that "the total consumption of ties for renewals only, by all of the railroads of the United States, is at least 100,000,000, to which add 20,000,000 for additional tracks and yards, and for the construction of new railroads, and the total is equivalent in board measure of more than 4,000,000,000 feet. The significance of these figures is more apparent when it is remembered that about 200 ties is the average yield per acre of forest, varying greatly in different localities, so that to supply this single item necessitates the denudation annually of over 500,000 acres of forest. But the cross tie supply is only one of the forest products required by the railroads. There are bridge timbers, fence posts, telegraph poles, building timbers of all kinds, including car material, all of which together it is estimated will equal in board measure the cross tie item, so that it is possible that the railroads of the United States require for all purposes, under present practices, the entire product of almost 1,000,000 acres of the forest annually." Dr. Herman von Schrenk, the foremost authority in this country on the subject of timber preservation and particularly in reference to the needs of railroads, says, "Up to within recent times most of the tie and construction timbers used by the railroads were timbers like the white oak and long leaf yellow pine. These were used because they combined great durability with strength and good wearing qualities. They were abundant along the lines of the roads and were obtainable in large quantities and at a comparatively low cost. A purchasing agent had no difficulty, not more than ten years ago, in getting any number of first class white oak ties in the middle or central states at from 35 to 60

cents. While the price for such timbers is not yet excessive, owing to local supplies, it is nevertheless becoming increasingly difficult to obtain large regular supplies of such timbers, and with an ever increasing demand, the question has been asked for several years, and with increasing anxiety, where the supply is to come from in the future. As a result of the uncertainty in getting a sufficient number of ties which could be used in the natural condition, many roads turned towards the so-called inferior woods, like red and water oak, beech, gum, the softer pines, hemlock, etc. None of these woods can be used without preservation, because they decay with great rapidity when in contact with the ground. It is a fortunate circumstance that these so-called inferior woods, because of their greater porosity, can be treated with chemicals so as to preserve them very effectively. Some day we may duplicate the conditions prevailing in eastern France, where the treated beech ties last until another crop of beech ties furnishes a new supply. Preservation will therefore be an almost indispensable factor in any consideration of future supply, and when one considers the good results obtained, its importance will be fully realized.

TABLE SHOWING ANNUAL CHARGES.

Timber and treatment.	Length of service.	Original cost.	Cost of treatment.	Annual charge.
White oak, untreated	10 years	\$0.85	.....	\$0.121
Red oak or loblolly pine, untreated	5 years	.40	.....	.124
Red oak or loblolly pine with zinc chloride treatment	10 years	.40	\$0.16	.085
Red oak or loblolly pine with zinc creosote treatment	16 years	.40	.25	.065
Red oak or loblolly pine with creosote treatment	20 years	.40	.45	.069

The conclusion to be drawn from such a table is that the treated timber in every case is cheaper in the long run than the untreated timber; furthermore, that the better treatments, although more expensive at first, are very much cheaper in the long run."

The Pennsylvania Railroad Company, which is one of the greatest systems in this country, after looking into the matter very carefully, have decided to grow on their own land a considerable part of the tie timber which they require. They use annually

east of Pittsburg and for repairs alone, over 3,000,000 ties besides 500,000 for new work. Three years ago they started to plant seedling locust trees, two or three years old, which cost when planted about 8 cents each. Most of the trees have been planted ten feet apart or about 400 to the acre, but in 1904 some 54,871 trees were planted six feet apart and 88,127, eight feet apart. The total number of trees planted to date is approximately as follows:

Fall, 1902	13,610	Fall, 1904	153,535
Fall, 1903	43,364	Spring, 1905	200,000
Spring, 1904	70,021	Fall, 1905	600,000

This road figures that at present, allowing 10 per cent for the immediate future increase, they will need about 3,850,000 ties per year and that their requirements will be constantly increasing. With their present consumption of 3,850,000 ties and figuring three ties to the tree, 1,300,000 trees must be cut each year. As it takes the yellow locust about thirty years to reach tie size, the Pennsylvania must have 39,000,000 growing trees and plant 1,300,000 each year, which would require about 97,500 acres for the purpose. Several other railroad systems have followed the example of the Pennsylvania, not so much with the idea of growing all the ties which they require as to show the farmers and other land owners along their lines how profitably their waste land can be utilized.

Many of the railroad companies, especially the Land Grant roads, own great tracts of timberland and now that they are well started, not only in timber preservation, but also in raising their ties, it is only natural that they should manage their forests systematically.

The federal forest service is carrying on extensive experiments in seasoning and treating ties at Escanaba, Michigan. This work was started in Wisconsin, but the tests are being made at Escanaba, where there is a large tie treating plant. The railroads are co-operating in this work, as they fully realize that something must be done to make the ties, and so the supply, last longer. It is particularly fortunate that the inferior woods, on account of being so porous, can be treated much more thoroughly than the more valuable hardwoods, so that the Lodgepole pine of the Rockies, which a few years ago was a much despised tree, is now in great

demand for ties. The people of Wisconsin have come to look upon the Jack pine as of very little value, but it has been proved that it makes a fair quality of paper pulp and it is more than probable that on account of its porosity it will take treatment well and make an excellent tie.

FORESTRY FOR THE INDIVIDUAL.

As the supply of timber decreases and the price steadily advances, owners of timberland are, more and more, studying the subject of forestry, as they realize that they cannot afford to continue to cut in the old way and thus destroy so much of the valuable young timber. This office has received letters from corporations and individuals, asking advice as to the best method of reforestation cut-over lands but, as a rule, it would be a pure waste of money to attempt to either seed or plant until the slash of the old lumbering operations has been disposed of. That is the pity of it, that not having burned the slash or left any seed trees, they now find that in order to turn their waste lands into productive, timber bearing areas, they must go to the heavy expense of collecting and burning old slash and then either plant or sow. It is all so unnecessary, for, if the owner when logging would only pile and burn the slash (at an expense of not to exceed 25 cents per M feet for all logs cut) and leave a few crooked or limby trees for seeding purposes, nature would do the work herself and the land would be growing a new crop of timber a year or two after the first cut. This is all that the forester, as a rule, advises the individual timberland owner to do, for usually an individual cannot go to the expense of planting and then wait 40 to 50 years for the first cut. But when the slash is burned and the land restocked with self sown seed, the owner at once has a property which is much more valuable than a desolate, burned waste. A few farsighted men are today buying land which is covered with a good reproduction of some valuable timber like white pine, Norway or hemlock, for they realize that within a few years all thrifty, valuable young timber will command a good price. The one thing that every owner of timberlands should always remember is that it is the worst kind of financial policy to cut young, rapidly growing timber. When this is once fully realized, for-

estry will become the rule and not the exception, for if the young growth be saved to increase rapidly in volume, then of a necessity only the mature timber will be removed and common sense would dictate that the slash must be piled and burned, so as to protect the young timber which is left standing from destruction by forest fires. This is conservative lumbering or forestry, which is based upon the knowledge that forests are a crop and that only the mature, ripe crop should be harvested.

Forestry is a very safe and sure long time investment, yielding as a rule from 5 to 6% on the investment and so in these "get rich quick" days, it appeals more strongly to the government, state or large corporation than it does to the individual owner. But many a man who will tell you that he cannot afford to hold his timber for a second cut is placing his money in a savings bank or insurance company and in neither case does he receive 5% on his money, which the young timber would pay him, not taking into consideration any increase in value of stumpage, which is almost certain to be steady and rapid.

The individual owner may only intend to log once and then sell his land but even in that case it is still a foolish policy to cut young, growing timber. Cutting only the mature timber is more expensive, as the logging is scattered, but the extra cost is more than made up by the increased growth of the young timber which is left standing.

Many individual owners in New York, Maine and New Hampshire have a steady, permanent income from their timberlands and would never think of allowing any contractor to take all the trees at one time, but hold them to the more or less mature timber, stating in the contract the diameter to which the cutting is limited.

Many lumbermen state that there are three factors which deter them from adopting forestry methods, viz., time, taxes and fire. The first is no deterrent, for it is a poor, foolish policy to cut young, unripe timber, even if you do not mean to hold the land for a second crop, for in any event land is now worth much more when it has growing timber on it.

Taxes, the second objection, is unfortunately a very valid reason in many sections of the state for not practicing forestry. Many town assessors seem to feel that they must tax the timberland owner, especially the non-resident owner, as heavily as possi-

ble and naturally in self-defense the owner is forced to cut his timber and so reduce the taxes to a reasonable amount. Then, when it is too late, the towns find that they have "killed the goose that laid the golden egg." However, the loss of the taxes on the timber is but a drop in the bucket compared to the irreparable damage to many communities from losing the industries which depended upon the forests for their raw material. To appreciate this one only needs to visit towns in which the sawmills have shut down on account of lack of timber.

Of late years the end of the timber has been largely hastened on account of the excessive taxes placed upon it. The whole system of forest taxation in this country is wrong, for it puts a premium on forest destruction. Would not our farmers have something to say and would they be as prosperous as they are, if their growing wheat and corn were taxed every day? And yet a crop of timber which may take from 40 to 150 years to grow and be ready for harvesting, is taxed every year. In order to be perfectly just and also to encourage the owner to let his timber grow until it is mature, and then cut conservatively, so as to place his business upon a permanent basis, there should simply be a tax on the land and none on the timber until it is cut. This is in line with the practice in England, Germany, France, Switzerland, Austria, Russia and Japan. Germany, which is the most progressive in this respect, taxes timberlands according to the gross or net revenue. This question is a most important one and its correct solution will hasten the general adoption of forestry by many years.

The third and last reason for not adopting forestry, viz., fire, seems more difficult to solve than it really is. Lumbermen have been in the habit of stating that forestry would never be a success until the forest fire problem was solved, but it is just because they did not adopt forestry methods that such fearfully destructive fires have followed their lumbering operations. If, twenty years ago, the state of Wisconsin had passed a law providing that in all lumbering operations the slash must be piled and burned, there would still be millions of acres of standing timber in the northern part of the state, which is now a burned, desolate waste. Several attempts were made to pass such a law, but in every instance it was killed by the lumbermen.

When the slashings are burned, only surface fires can follow and these do only a relatively small amount of damage. With any sort of proper care, hardwood forests should be almost immune from destructive fires and even in pure coniferous forests, the most dangerous of all, burning the slash and a close watch by means of fire wardens during the dangerously dry seasons, reduces the danger to a minimum.

The United States Indian department is now providing in all new contracts that loggers on Indian reservations must pile and burn the slash, and that this is entirely feasible and practical was testified to by Mr. F. E. Weyerhaeuser of St. Paul in his address before the American forest congress in Washington, January, 1905, when he said: "The next obstacle [to forestry], more important because harder to overcome, is fire. I am frank enough to say that in this matter lumbermen themselves are largely responsible, sometimes even to the extent of fighting reform. For example: two years ago a bill was proposed in Minnesota providing for the burning of slashings. Because of the opposition of the lumbermen, it was never reported out of the committee. Since then the government has required the burning of slashings on the Leech Lake Indian reservation. The wise and moderate regulations suggested by the Bureau of Forestry were introduced with complete success. It was a splendid object lesson. A wisely drawn bill presented to the legislature today would be supported by the best of lumbermen." In Wisconsin the slash is being piled and burned on both the Bad River and Flambeau Indian reservations.

Of course, it would never do to let the fire run through the slash without piling it, for such a fierce fire would be the result that all the young growth would be destroyed. The slash should be piled in the winter when the logging is being done and then must be burned in the spring before the forests become thoroughly dry. If summer logging is carried on, the slash should be piled as the cutting proceeds and burned as soon as possible on wet days when the fire will not run. If the timberland owner will pile and burn his slashings, he will be fairly safe from forest fires and the additional protection which the state and town afford him is explained under the section "Fire Warden System."

THE FARM WOODLOT.

The rapidly increasing value of timber is causing the American farmer to begin to pay some attention to the care of his woodlot, which in nearly every case is such a valuable component part of the farm. Many of the settlers in the northern part of Wisconsin are quite as much lumbermen as farmers and receive a large part of their income from the sale of saw logs, pulpwood, cordwood and bark, and they should be particularly interested in forestry, as they naturally expect to own and operate their woodlots for many years.

Farmers should always remember that their timber is a valuable asset, becoming daily more so through the rapid depletion of the forests, and that where their timber grows on soil unsuited or poorly adapted to agriculture, it will oftentimes pay them far better to cut carefully and systematically, thus securing a steady financial return, than to cut everything at once and then clear land which nature, doubtless, intended for forest growth.

The farmers of Maine, New York and New Hampshire have very much the same conditions and problems and have found out by experience that their timberlands are money producers, and that it is much better to have a small area of good plow land than a lot of sand or rock which should never have been cleared. The abandoned farms in New England are a striking example of just such fearfully costly mistakes and nature herself is now re-stocking them with forests, as if pointing out to man his error.

In discussing the treatment of the woodlot, only such points will be considered as apply to farm timberlands in all sections of the state. In each case, the farmer must determine for himself whether it will be more profitable for him to grow the largest possible amount of timber on his land or if he should strive first of all to secure quality. This will depend upon the character of his timber and the local market, for if the object is to grow cordwood, quantity is what he wants, but if saw logs, then usually quality. In either case, the young forest should be kept very dense, so that only a small amount of sunlight can reach the ground, thus forcing the trees to grow rapidly in height. Thus a well-stocked, more or less even aged forest will have the greatest amount of timber per acre, and where quantity is desired, the timber should be

thinned out, as soon as such thinnings will pay for themselves, before the fierce struggle for existence begins, which lessens the increase in wood in the whole forest, though forcing the survival of the fittest. In other words, such thinnings will allow the trees to gain in diameter more rapidly, thus making quantity of wood, while if the forest had been kept dense and the struggle allowed to continue until the trees had reached their height growth, the stems of the survivors would have been unusually long and clear, and then after thinning would increase rapidly in diameter with little danger of forming side branches.

Most people do not understand that trees grown in open woods and in clearings will always form branches, often nearly to the ground, on account of having so much side light, which develops the dormant buds under the bark, and that in order to grow clear lumber, woods must always be kept dense.

FOREST MANAGEMENT.

Most woodlots are altogether too park like, with a few scattered trees, large and limby, only fit for cordwood, and a heavy covering of grass on the soil. Grazing in such woods does very little harm, as there is practically no young growth to be injured, but where the farmer expects to make anything out of his woodlot, he should exclude all cattle and even horses where there is much young growth.

A valuable tree takes up no more room than a worthless one and therefore all the trees which are over-mature, decaying, crooked, large crowned and of a poor species, should be taken out as soon as possible without opening up the forest too rapidly and thus allowing the soil to dry out. In many cases the blanks so formed will be restocked by self sown seed from the more valuable trees which have been left standing, or they can be sown or planted either with nursery plants, transplants raised on the farm or wild seedlings from nearby forests. Where a heavy grass has been allowed to form in open, park like woods, it must be either burned off, where there is no young timber to be killed, or else plowed under, in order that the self sown seed may reach the soil and germinate.

The best grade of white pine grows in Wisconsin, it is a valuable timber which will always be in demand, and for various other reasons it is recommended for planting. When two year old nursery plants are bought and labor hired, planting 1,210 white pine per acre (six by six feet), costs from \$7 to \$9. But when the plants are raised on the farm, or wild seedlings gathered, the cost will be reduced to from \$4 to \$6 per acre.

Hardwoods can be grown very easily by gathering the nuts or acorns in the woods and planting them in the ground to a depth of from 1½ to 3 inches.

On all farms there are also certain sections which are not arable and it is a very easy and inexpensive matter to plant them up, thus either securing a future supply of timber or else making the farm more readily salable. Whenever possible, the woodlot should be on the highest land on the farm, which is not arable, so that the snow water which will be held within it as in a great sponge may sink to the lower cultivated fields during the hot months when the crops are often so badly in need of water. When the woodlot has been fully stocked with valuable species, the greatest care should be taken to keep the stand dense and at first, in order to prevent the trees from forming side branches, it may pay to do a certain amount of pruning, though such an operation would, of course, be out of the question for a lumberman over any large area of forest.

Pruning pine or other conifers will often pay and is very easy, as a man with a sharp axe can cut off the limbs cleanly, close to the bark, as high as he can reach; but pruning hardwoods is not so satisfactory, much more difficult and should only be undertaken when it is very certain that it will pay. Pruning should be done when the trees are young, so that the wounds will heal over rapidly, and only such trees should be pruned as are expected to form part of the final crop.

IMPROVEMENT CUTTINGS.

As previously stated, the first cuttings on nearly all woodlots, as they are usually in bad shape from neglect, should remove the worthless and inferior trees which are simply taking up space in the forest which might be occupied by valuable species. The

trees to be cut should be marked by the owner, or some one who will use careful judgment, and all cuttings should be done in deep snow, so as to avoid all possible injury to the young growth.

In a dense stand of young timber which has reached the pole stage, the struggle to dominate is often so severe that the growth of the forest is seriously retarded, so that whenever the operation will pay for itself, thinnings should be made in order to give the best young trees a chance for much more rapid development. Such thinnings should be made most carefully, removing the dead, dying and suppressed trees in order to favor the best which are shooting ahead, but in no case forming large blanks which would dry out, thus losing humus and soil fertility and checking reproduction. Later on, when the trees thus favored in the thinning are reaching merchantable size, reproduction cuttings should be made, so as to restock the area with self sown seed of the best species and to do it so that the ground is fully restocked before the old timber is removed.

When the over-mature, large crowned, defective and worthless trees have been removed, the remaining timber, especially the young growth which has been more or less shaded and suppressed, will receive more sunlight and thus the rate of growth will be increased. After a careful examination in the forests of the Adirondack mountains of New York, it was found that fully 20% of the remaining trees were affected and that on the average the rate of growth was increased 50%. This is an extremely important point to bear in mind, for it means a corresponding increase in the interest on the capital invested.

INCREASED GROWTH AFTER LUMBERING.

As previously stated, one of the important reasons for limiting the logging operations to the large, more or less mature timber, is because the smaller trees which are left standing will grow so much more rapidly after the large timber has been removed. This increased growth is accounted for simply from the fact that the humus disintegrates more rapidly and that the small timber which has grown up somewhat under the shade of the dominant trees, receives a large increase of di-

rect sunlight and room to spread both its root system and crown. The timberland owner, therefore, who cuts small timber is robbing himself of the increased growth and, hence, the added volume which he might have.

In 1898 Gifford Pinchot, the present head of the U. S. forest service, made a working plan for a tract of 40,000 acres of timberland in the Adirondack mountains of New York, owned by Dr. W. S. Webb. During the preparation of this working plan, 2,000 small trees, which had been left in the first lumbering operations, were cut and carefully measured to determine how their rate of growth had been affected by the cutting. The rate of growth of 298 trees in the original forest was also determined, so as to compare the results, which are extremely interesting, as will be seen from a study of the following table:

(Figures compiled from "The Adirondack Spruce.")

Diameter of tree. Inches.	In the virgin forest, number of years re- quired to grow one inch in diameter. Column 1.	After first cutting, number of years re- quired to grow one inch in diameter Column 2.
5	12	10
6	13	6
7	12	6
8	10	5
9	9	5
10	8	5
11	8	5
12	6	4
13	6	6
14	7	
15	8	

It will be seen from column 1 that in this particular region it takes a spruce tree of 5 inches in diameter 12 years to grow one inch while a 12 or 13 inch tree only requires 6 years, just half as much. Spruce in the Adirondacks is chiefly valuable for pulp and the pulp and paper companies were in the habit of cutting down to 5 inches, thus taking trees which had not begun to get their maximum growth. Taking into consideration the amount which could be obtained on the first cut and the rate of growth, it was recommended that the cutting be limited to trees of 12 inches in diameter, which was done. Now, looking at column 2, we find that the rate of growth of trees

left after the first cutting is greatly increased, in several instances from 75 to 100 per cent., which means just that much increase on the capital invested. A 6 inch tree, which required 13 years in the virgin forest to increase one inch in diameter, will add just as much to its volume, after the first cutting and when it receives more light, in 6 years. In the same way, a 7 inch tree, requiring 12 years in the virgin forest, only takes 6, after the first cutting. As the trees become larger in diameter, the difference is less, until we find that a 13 inch tree requires both in the virgin forest and with more open conditions, 6 years to increase one inch in diameter, proving that trees which have grown for a long time under dense shade cannot shoot ahead when the shade is removed. This also proves that in the case of spruce in the Adirondacks, it is well enough to cut to 12 or 13 inches, as the trees have passed their time of fastest growth, but that it would be a great mistake to cut below this limit.

In Wisconsin, we are more directly interested in the rate of growth of white and Norway pine, hemlock, etc., than in spruce, which constitutes only a small portion of our timber. At present, figures on the rate of growth of all the merchantable species in Wisconsin are being compiled but are not yet completed for publication.

In 1896 Messrs. Pinchot and Graves made a careful study of the white pine in Pennsylvania and the following facts and figures are taken from their book "The White Pine." "The lumber length of a tree increases with the diameter. In the table which follows, the lumber length is regarded as the length from the level of the ground to the uppermost end of the merchantable timber, which was taken at the point determined by the actual practice of the lumbermen in each case. For the sake of convenience in determining the lumber length of standing trees, the stump has been disregarded.

DIAMETER BREAST HIGH IN INCHES.

10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
68.3	72	75.2	77.2	79	80.5	81.5	82.3	83	83.5	84	84.5	84.8	85	85.3	85.5

LUMBER LENGTH IN PER CENT OF TOTAL LENGTH.

"This table presents the relatively smaller loss from trees of large diameter under the present demands of the market. A glance at it shows that, while over 85 per cent of the length of a tree 40 inches in diameter is valuable for lumber, the proportion falls to 80.5 per cent at the diameter of 20 inches, and to 68.3 per cent when the diameter is only 10 inches. The comparatively slow increase of the percentage of lumber length after a diameter of 20 inches has been reached is interesting in connection with the slow rate of height growth in old trees."

And later on, speaking of the relation of the sap-wood to the total volume of the tree, they say: "We find that, with increase in the diameter of a tree, the percentage of sap-wood falls off, as shown by the following table:

DIAMETER BREAST HIGH IN INCHES.

10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
VOLUME OF SAP-WOOD IN PER CENT OF THE TOTAL VOLUME OF WOOD.															
37	34	31.3	28.8	26.6	24.6	22.9	21.5	20.2	19.2	18.2	17.5	16.8	16.1	15.5	15

"Since the best grades of lumber are required to be free from sap-wood, the figures in this table exhibit clearly one of the reasons why a better product is cut from large logs than from small ones. They show that in spite of the steady increase in the number of rings of sap-wood as a tree grows older, it forms a less and less important part of the whole bulk of the tree."

All the available data proves in one way and another that often times the young timber which is cut actually does not pay for the cost of its removal and that in every case, young timber which is left standing increases rapidly in growth, which means increased returns on the capital invested.

INCREASE IN STUMPAGE VALUES.

Mr. James T. Barber, president Northwestern Lumber company, Wisconsin, when speaking on this subject before the American forest congress in Washington in 1905, quoted the experience of Cornell with white pine lands in Wisconsin as

showing the wonderful rise in stumpage. In 1865 Hon. Ezra Cornell, who founded the university named after him, purchased with scrip and for the university, 500,000 acres of pine lands in Wisconsin. The scrip cost him 60 cents per acre, which, at the very low estimates then customary, made the pine stumpage cost from 6 to 10 cents per thousand feet. The 500,000 acres have now been practically all disposed of at a clear profit, after paying all expenses, taxes, etc., of \$5,500,000, and some of the last sales of the pine stumpage have been at from \$10 to \$12 per M. Now, in 1906, the best white pine stumpage has risen to from \$15 to \$18 per M and it is not at all improbable that within the next few years it will have risen to \$20.

The supply of white pine, however, is decreasing so rapidly in Wisconsin that within a very few years it will cease to be an important factor in the lumber industry of the state and hence the rise in stumpage prices of other species, already so marked, will be far more important.

Only a few years ago hemlock was considered of very little value but now it is being extensively manufactured into lumber and 100,000,000 feet is used annually for pulpwood. Since 1903 hemlock stumpage has risen from \$1.50 to \$4 and even at the latter price, it is comparatively cheap, taking into consideration the price at which pine is selling and the triple demand for hemlock, namely, for lumber, pulp wood and bark for tanning. Therefore, the rise in hemlock stumpage will probably be both rapid and constant, for, as the supply of pine for lumber and spruce for pulp wood rapidly diminishes, the demand will become greater and greater.

In many portions of the state cedar is becoming very scarce, while in others there is still an ample supply, so that prices differ widely, but on the whole it may be said that within the last three years cedar stumpage has risen from \$3 to \$5. The great value of tamarack is at last being appreciated, as is shown by its rapid rise in price, for in the last few years it has risen from \$2 to \$5, \$6, \$7 and even in some cases to \$11 per M.

Extensive operations in hardwoods are comparatively recent and hence the stumpage can still be bought at a relatively low

figure but it is safe to say that the chances are all in favor of a much more rapid rise in the near future.

As Mr. Barber pointed out in his address, pine stumpage has steadily risen for fifty years, irrespective of the ups and downs of the lumber market and this has been the history of all timber, not only in Wisconsin but all over the United States. This being the case, it has seemed the most short sighted policy for lumber companies to slash their timber lands, taking only the best logs and destroying the young growing timber, and in many cases, especially when the market for lumber was low, they have butchered their timber to no purpose, for they would have made more money if they had held the stumpage.

Certainly, owners of stumpage must soon come to realize that they cannot afford to sell to lumber companies without some restrictions on the cutting, for otherwise their timberlands will be either destroyed or at least seriously injured in the lumbering. As previously stated, the owners of spruce lands in New York and Maine limit the diameter to which their timber shall be cut. The following contract is used by this office in selling timber on state forest reserve lands:

CONTRACT BETWEEN THE STATE BOARD OF FORESTRY OF WISCONSIN AND

..... of,

This agreement made and entered into this..day of....., 190.., between the State Board of Forestry of Wisconsin, party of the first part, and....., party of the second part.

Witnesseth, that the said party of the first part agrees to sell to the party of the second part, under the following rules, the mature white and Norway pine, tamarack and spruce on the following described lands,, at the following prices, which have been bid by the party of the second part, viz.:

White pine	\$12.15 per M. ft.
Norway pine.....	11.05 per M. ft.
Tamarack.....	5.05 per M. ft.

The logs shall be scaled by the Scribner decimal C rule and it is hereby understood and agreed that the cost of scaling shall be equally divided between the parties of the first and second parts.

The party of the second part agrees to cut the timber in accordance with the following rules:

RULES FOR LOGGING.

1. No trees shall be cut which are not marked for cutting by the party of the first part.

2. If unmarked trees are cut, they shall be scaled and paid for at double the stumpage price for the species cut.

3. All trees marked and containing merchantable timber shall be cut.

4. No trees containing merchantable timber shall be left lodged in the woods. Care shall be taken not to injure young growth while cutting or hauling the timber. No white or Norway pine, spruce, cedar, tamarack, hemlock or basswood shall be used for bridges, corduroy, skids, slides, or for building camps or dams, unless the scarcity of less valuable timber makes its use absolutely necessary. All merchantable timber used for skids shall be cut into logs and scaled. Any logs left in the woods or along the roads will be scaled.

5. The party of the second part agrees to pile all slash as the cutting proceeds and to burn the same at such times and in such manner as the party of the first part may direct.

6. The violation of any of the above rules if persisted in, shall be deemed a sufficient cause for annulling the contract.

Actually marking every tree which is to be cut is far more satisfactory than merely limiting the diameter, and is not difficult or expensive, as a crew of three men can readily mark from 40 to 60 acres a day, according to the stand, and the work should not cost over 12 cents an acre.

Appendix

State Forestry Laws.

CHAPTER 264, LAWS of 1905.

AN ACT creating a forestry board, to appoint fire wardens and trespass agents and making an appropriation therefor.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

State board of forestry. SECTION 1. There shall be a state board of forestry, consisting of the president of the state university, the director of the state geological survey, the dean of the state agricultural department, the attorney general and one other member to be appointed by the governor. Said board shall select its own president and shall perform the duties hereinafter provided; and shall meet on the second Monday in January, April, July and October of each year, and at such other times as may be necessary. They shall receive no compensation except their actual expenses to be audited by the secretary of state and paid out of the state treasury.

State forester and his duties. SECTION 2. There shall be a state forester, who shall be a technically trained forester, appointed by the state board of forestry, and whether any candidate for this position is a technically trained forester shall be determined by certificate from the secretary of the United States department of agriculture. He shall receive a salary of twenty-five hundred dollars per year, and the actual and necessary traveling and field expenses, incurred in the conduct of his official business; be empowered to appoint a clerk whose salary shall not exceed eight hundred dollars per annum; be supplied with suitable offices in the capitol building; be entitled from the superin-

tendent of public property to such stationery, postage and other office supplies and equipment as may be necessary; be authorized to purchase all necessary field supplies, equipment and instruments; be furnished by the state all necessary printed forms and notices and the publications hereinafter provided; and shall act as secretary of the state board of forestry. He shall, under the supervision of the state board of forestry, execute all matters pertaining to forestry within the jurisdiction of the state; direct the management of the state forest reserve; collect data relative to forest destruction and conditions; take such action as is authorized by law to prevent and extinguish forest fires and to prevent forest trespass; cooperate in forestry as provided under section 5 of this act; advance as he may deem wise, by the issuing of publications and by lectures, the cause of forestry within the state; and may, upon invitation of the board of regents of the University of Wisconsin supervise such courses in forestry as may hereafter be provided for at said university. He shall prepare annually a report to the state board of forestry on the progress and condition of state forest work, and recommend therein plans for improving the state system of forest protection, management, replacement and taxation. The state board of forestry shall report annually a summary of such facts to the governor.

State forest reserve. SECTION 3. The sale of all lands belonging to the state north of town 33 shall cease upon the passage of this act, and such lands north of town 33 shall constitute the state forest reserve; provided, that those state lands within said forest reserve which after examination by the state forester are found by him to be more suitable for other purposes than for the purposes of the state forest reserve because of their character, condition, extent or situation, may be sold by the commissioners of the public lands, upon the recommendation of the state forester and with the approval of the state board of forestry. The state forester shall, under the supervision of the state board of forestry, direct the management of the state forest reserve, to which end he may employ the necessary assistance, and may upon said reserve institute conservative lumbering, make and maintain forest nurseries, plantations and fire lines and execute other silvicultural and protective measures necessary to the highest permanent usefulness of said reserve to the state. In such conservative lumbering the state forester is authorized, under the supervision of the state board of forestry, to remove or cause to be removed, when and in such manner as he may deem advisable, wood, timber, or other products from said reserve. Such wood, timber or other products shall be sold to the highest bidder upon contracts executed and signed by the state forester,

on behalf of the state, subject to the approval of the state board of forestry.

Grants of land for state forest reserve. SECTION 4. The state board of forestry is hereby authorized, when in its judgment it is advisable to accept on behalf of the state any grant of land within the state, which shall become a part of the state forest reserve; provided, that no such grant shall be accepted until its title has been examined by the attorney general and a report made to said board of the results of such examination.

Public parks. SECTION 4a. The state board of forestry shall visit points of natural interest in the state and examine into and consider the propriety and desirability of securing such places as public parks. Said board may further investigate as to the price and report its conclusions to the next session of the legislature.

Cooperation in forestry. SECTION 5. The state forester shall, acting under the supervision of the state board of forestry, whenever he deems it necessary to the best interests of the people and the state, cooperate in forest surveys, forest studies and forest protection, and in the preparation of plans for the protection, management, replacement of trees, woodlots and timber tracts, with any of the several departments of the federal or state governments or the governments of other states, and with counties, towns, corporations and individuals.

Assistant state forester. SECTION 6. There shall be an assistant state forester, who shall be a technically trained forester, appointed by the state forester with the approval of the state board of forestry. He shall receive a salary of fifteen hundred dollars per year, and the actual and necessary traveling and field expenses, incurred in the conduct of his official business. He shall perform such duties as may be assigned to him by the state forester, and shall represent the latter in case of disability or absence.

State and town fire wardens. SECTION 7. The state forester shall also be state fire warden, and the assistant state forester shall be assistant state fire warden. The state forester shall appoint one or more town fire wardens for those organized towns in which he deems it necessary, or for such portions of organized towns as he may define, and he may remove any fire warden from office. He shall give the necessary instructions to said fire wardens and supervise the execution of their work.

Powers and duties of town fire wardens. SECTION 8. Each town fire warden, before entering upon his duties, shall take an oath of office and file the same with the state forester. All town fire wardens shall take prompt and effective measures against the spread and illegal setting of forest, marsh or swamp fires within their own and adjoining towns and have the power of sheriffs to arrest without warrant for violations of the provisions of this act. They shall have authority to call upon any able bodied citizen, in territory in which they act, to assist in extinguishing forest, marsh or swamp fires in such manner as they may direct. The town fire wardens shall first submit to the state forester itemized accounts for their own services and the services of their assistants, and no accounts shall be paid out of the treasury of the town in which such services have been rendered without a written approval of the state forester. The town fire wardens and those assisting them shall receive such compensation for their services in carrying out the provisions of this section as the town board shall allow, not to exceed 25 cents per hour for the time actually employed; provided, that the total of such accounts shall not exceed one hundred dollars for each thirty-six sections in any one year in any one town. The state forester is authorized to approve for payment not to exceed 50 per centum of the clear proceeds of any fine collected in an action brought for a violation of any of the provisions of sections 17 or 18 of this act, or sections 4405a or 4406, statutes of 1898, relating to setting, failure to put out or care of fires, where the evidence to secure a conviction is furnished by a town fire warden or any other person.

Liability of town fire wardens and citizens. SECTION 9. Any town fire warden who shall refuse to carry out the provisions of the preceding section or any able bodied citizen who shall refuse to render assistance as provided by said section, shall be punished by a fine of not less than ten, nor more than fifty dollars, or by imprisonment in the county jail for not less than ten days or more than thirty days, or by both such fine and imprisonment.

Fire warning notices. SECTION 10. Each town fire warden shall post or cause to be posted conspicuously in those parts of his town where fires are likely to occur, all notices furnished him for that purpose by the state forester, and he shall receive therefor compensation at the rate provided in section 8 of this act.

Report of fire wardens. SECTION 11. Every fire warden, immediately after each fire within his territory, shall forward to the state forester a detailed report of said fire, and shall report annually on or

before the first day of December a summary of all forest fires and such other matters as the state forester may direct.

Trespass agents. SECTION 12. The state forester shall also be state trespass agent and the assistant state forester, assistant state trespass agent. As state trespass agent, the state forester shall appoint, and may remove from office, such trespass agents as he may deem expedient. He shall give the necessary instructions to said trespass agents and shall supervise the execution of their work. The state forester is authorized to approve for payment to any trespass agent or other person, upon whose evidence successful action is brought for trespass upon any portion of the state forest reserve, not to exceed 25 per centum of the amount collected for such trespass, which payment shall be made by the state treasurer. Provided that in no case shall such payment exceed five hundred dollars (\$500.00).

Oath and liability of trespass agents. SECTION 13. Every person appointed as trespass agent under authority of this act, shall, before entering upon his duties, take and subscribe the following oath of office: "I do solemnly swear that I will support the constitution of the United States and of the state of Wisconsin; that I will not engage, either directly or indirectly, in the purchase for my own benefit or for the benefit of any other person, of any state lands or products from said lands, so long as I remain a trespass agent, and that I will faithfully and to the best of my ability discharge the duties of such position, so help me God." Such oath of office shall be filed with the state forester. Any trespass agent who violates the terms of his oath regarding the purchase of state lands or products therefrom, shall be punished by a fine not less than three times the price paid for said land, or three times the market value of said products, or by imprisonment in the county jail for not less than thirty days or more than ninety days, or by both such fine and imprisonment.

Powers of trespass agents. SECTION 14. All trespass agents shall have the power of sheriffs to arrest without warrant for any violation of the provisions of this act. It shall be the duty of every trespass agent to immediately report to the state forester and the district attorney of the county in which such trespass is committed, all cases of trespass upon state lands, which come to his knowledge, and to furnish these officers with information required by them concerning said trespass.

District attorneys to prosecute. SECTION 15. Whenever an arrest shall have been made for any violation of any provision of this act, or

whenever any information of such violation shall have been lodged with him, it shall be the duty of the district attorney of the county in which the criminal act was committed to prosecute the offender or offenders. If any district attorney should fail to comply with the provisions of this section he shall be guilty of a misdemeanor and upon conviction shall be fined not less than \$100 nor more than \$1,000, or be imprisoned not less than thirty days nor more than one year, or both in the discretion of the court. The penalties of this section shall apply to any magistrate, with proper authority, who refuses or neglects without cause to issue a warrant for the arrest and prosecution of any person or persons when complaint, under oath, of violation of any terms of this act has been lodged with him.

Destruction of warning notices. SECTION 16. Any person who shall maliciously or wilfully destroy, deface, remove or disfigure any sign poster or warning notice posted under the provisions of this act shall be guilty of a misdemeanor and punishable upon conviction by a fine of not less than \$15 nor more than \$100, or by imprisonment in the county jail for a period of not less than ten days nor more than three months, or by both such fine and imprisonment.

Engines in forest land; burning weeds, etc. SECTION 17. It shall be unlawful for any logging locomotive, donkey or threshing engine, railway locomotive and all other engines, boilers and locomotives operated in, through or near, forest, brush or grass land, which do not burn oil as fuel, to be operated without a netting of steel or iron wires so constructed as to give the most practicable protection against the escape of sparks, cinders or fire from the smoke stacks thereof, and each such engine shall be provided with adequate devices to prevent the escape of fire from ash pans and fire boxes. Every railroad company shall, at least once in each year, as far as practicable, cut and burn or remove from its right of way all grass and weeds and burn and remove therefrom all brush, logs, refuse material and debris within a reasonable time, and whenever fires are set for such purpose shall take proper care to prevent the escape thereof from the right of way. No railroad company shall permit its employees to deposit fire, live coals or ashes upon their tracks, outside of the yard limits, except they be immediately extinguished. Engineers, conductors or trainmen who discover that fences or other material along the right of way or on lands adjacent to the railroad are burning or in danger from fire shall report the same to the agent or person in charge at their next stopping place at which there shall be a telegraph station. Railroad companies shall give particular instructions to their section employees for the prevention and prompt extinguishment of fires, cause notices, which shall be fur-

nished by the state fire warden, to be posted at their stations, and when a fire occurs along the line of their road, or on lands adjacent thereto, for which fire they are responsible, they shall concentrate such help and adopt such measures, as shall most effectually arrest its progress. The state fire warden, or his assistant, whenever it shall appear necessary, shall inspect the right of way of any railroad company for the purpose of ascertaining whether the provisions of this section have been complied with. Any person wilfully failing to comply with the requirements of this section shall be deemed guilty of a misdemeanor and shall be punished, upon conviction, by a fine of not less than fifty nor more than five hundred dollars, or by imprisonment in the county jail not exceeding one year, or by both such fine and imprisonment. Any corporation by its officers, agents or employes, wilfully violating the provisions of this section shall be liable to a fine of not less than fifty dollars nor more than five hundred dollars for each and every such violation, to be collected in a civil action in the name of the state.

Civil liability for forest fires. SECTION 18. In addition to the penalties provided in the preceding sections of this act, the United States, the state, the county or private owners, whose property is injured or destroyed by such fires, may recover, in a civil action, double the amount of damages suffered, if the fires occurred through wilfulness, malice or negligence. Persons or corporations causing fires in violation of this act shall be liable to the state in an action for debt, to the full amount of all damages done to state lands and for all expenses incurred by the towns fighting such fires.

Criminal action; forest trespass. SECTION 19. Every person who, unlawfully and wilfully cuts, injures or destroys any kind of wood or timber standing, lying or growing upon the lands of another, or of the state, or of the United States, or upon any public highway, or unlawfully and wilfully injures or destroys or carries away any of the products of such wood or timber lands is guilty of a misdemeanor, and upon conviction shall be fined not less than \$25 nor more than \$1,000 or be imprisoned not less than fifteen days nor more than three years, or by both such fine and imprisonment.

Civil liability for forest trespass. SECTION 20. In addition to the penalties provided in section 19 for wilful trespass on forest lands, the state, the county or the private owners, upon whose lands the wilful trespass was committed, may recover in a civil action double the amount of damages suffered. This section shall not apply to the cut-

ting of wood or timber from uncultivated woodland for the repair of a public highway or bridge upon or adjacent to the land.

Disposals of moneys from management of state forest reserve. SECTION 21. All moneys received from the sale of wood, timber, minerals or other products, and from the sale of state forest reserve lands, and penalties for trespass thereon, as hereinbefore provided, except when otherwise disposed of by constitutional provision, shall be paid into the state treasury and shall constitute a forest reserve fund which shall be disbursed only for the purchase of lands to be added to the state forest reserve and for the improvement and protection of said reserve and for the employment of the necessary assistance therefor, as hereinbefore provided, by or upon the order of the state forester, with the approval of the state board of forestry.

Appropriation. SECTION 22. There is hereby appropriated out of any funds in the state treasury not otherwise appropriated an annual appropriation of nine thousand eight hundred dollars to pay the annual salaries provided by the terms of this act, and for carrying out the provisions of this act. If all of said sum be not expended in any one year the balance not so expended may be used for the purpose aforesaid in any subsequent year.

SECTION 23. Paragraph 18 of section 1038; sections 1469, 1470, 1471 and 1816a, Wisconsin Statutes of 1898; sections 7 and 9 of chapter 432, laws of Wisconsin of 1901; chapter 450, laws of Wisconsin of 1903, and all acts and parts of acts inconsistent or in conflict with the provisions of this act are hereby repealed.

SECTION 24. The repeal of said sections and acts shall not affect any act done or right accrued or established, or any proceeding, suit or prosecution had or commenced in any civil or criminal action or proceeding previous to the time when such repeal shall take effect; but every such right or proceeding shall remain as valid and effectual as if the provision so repealed had remained in force.

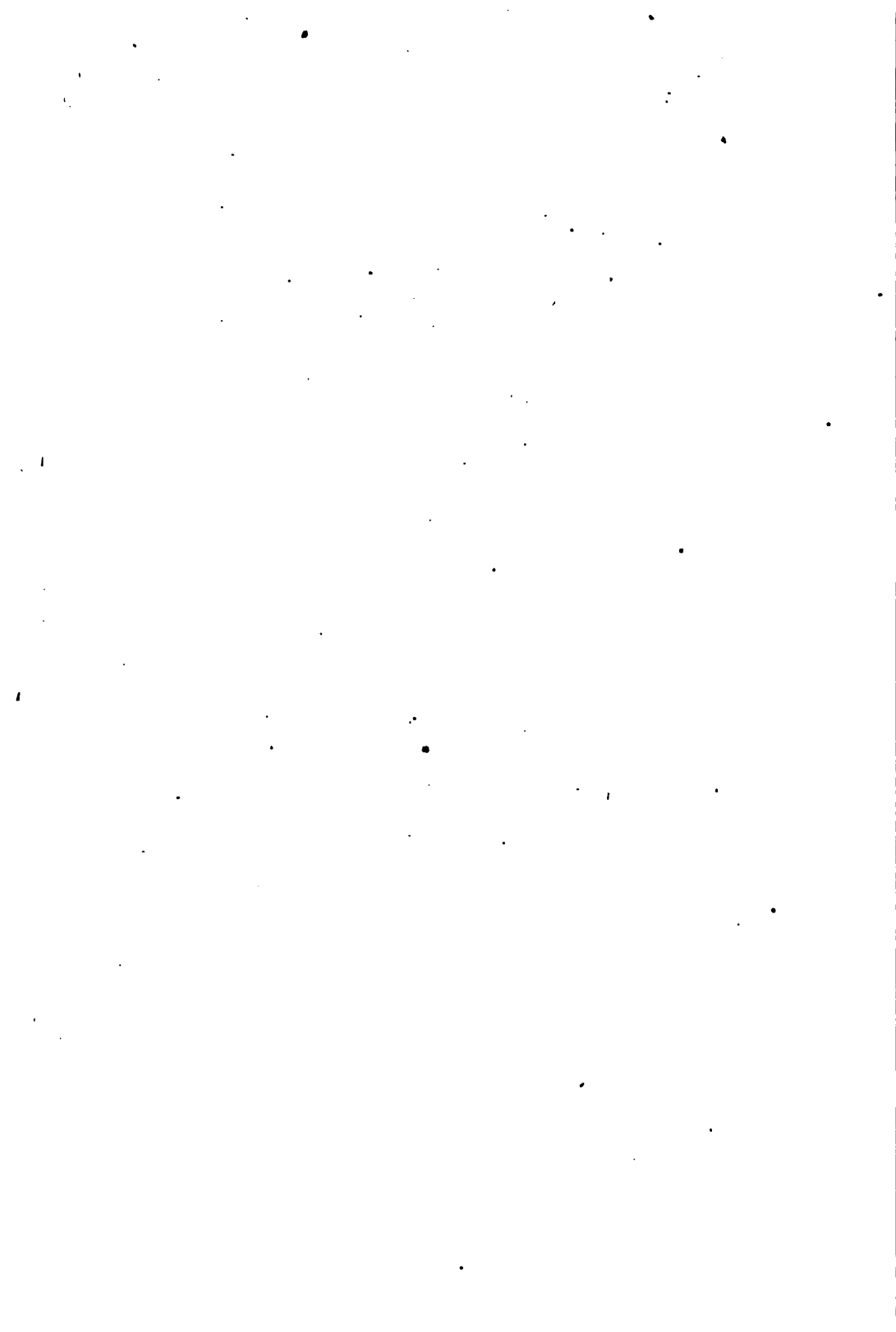
SECTION 25. This act shall take effect and be in force from and after its passage and publication.

The two following sections, statutes of 1898, were not repealed and form an important part of the forestry law:

Section 4405a, statutes of 1898, provides as follows: Whenever the fire warden of any town becomes convinced that a dangerously dry time exists in its vicinity, and that it is imprudent to set fire on any land, he shall post or cause to be posted, a notice in three public places in such town forbidding the setting of any such fire therein, and after the posting of such notices no person shall set any fire upon any land in said town, except for warming the person or cooking food, until written permission has been received from one of the fire wardens of said town. All persons who start camp fires shall exercise all reasonable precautions to prevent damage therefrom, and shall extinguish the same before leaving them. Every person violating any provision of this section shall be punished by a fine of not more than \$50 or by imprisonment in the county jail not more than six months for each offense.

Section 4406, statutes of 1898, provides as follows: Any person who shall build a fire on any lands in this state not his own or under his control, except as hereinafter provided, shall before leaving the same, totally extinguish it, and upon failure to do so shall be punished by a fine not exceeding \$100 or by imprisonment in the county jail not exceeding one month, or by both such fine and imprisonment. Any person who shall negligently or wilfully set fire to or assist another to set fire on any land, whereby such land is injured or endangered or shall wilfully or negligently suffer any fire upon his own land to escape beyond the limits thereof, to the injury of the land of another, shall be punished as hereinbefore provided and be liable to the person injured for all damage that may be caused by the fire.





FIRST BIENNIAL REPORT

OF THE

State Civil Service Commission

OF WISCONSIN

FROM

June, 1905, to December, 1906, inclusive.



MADISON, WIS.
DEMOCRAT PRINTING COMPANY, STATE PRINTER
1907

CIVIL SERVICE COMMISSIONERS.

SAMUEL E. SPARLING, President, Madison.

THOMAS J. CUNNINGHAM, Chippewa Falls.

OTTO GAFFRON, Plymouth.

SECRETARY AND CHIEF EXAMINER,

F. E. DOTY, Madison.

CHIEF CLERK,

J. M. SEXTON.

STENOGRAPHER,

CAROLINE B. GREIG.

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DIRECTORY OF LOCAL EXAMINERS.

County.	Examination Center.	Local Examiner.	Post Office.
Adams.	Friendship.	J. P. Lewis, Sup. Ex. B. S. Harrison. J. B. Keyes.	Friendship. Friendship. Friendship.
Ashland.	Ashland.	J. T. Hooper, Sup. Ex. Carl Rudquist. W. S. Cate.	Ashland. Ashland. Ashland.
Barron.	Barron.	E. C. McClelland, Sup. Ex. M. S. Hines. C. W. Meadows.	Rice Lake. Rice Lake. Barron.
Bayfield.	Washburn.	S. A. Oscar, Sup. Ex. A. M. Worden. M. M. Sweet.	Washburn. Washburn. Washburn.
Brown.	Green Bay.	William O. Brown, Sup. Ex. Timothy Burke. Joseph Martin.	Green Bay. Green Bay. Green Bay.
	De Pere.	J. W. Steenis Sup. Ex. B. F. Smith.	De Pere. De Pere.
Buffalo.	Alma.	W. J. Eberwein, Sup. Ex. Robert Lees. J. A. Ganz.	Alma. Alma. Alma.
Burnett.	Grantsburg.	Mabel Ahlstrom, Sup. Ex. A. J. Myrland. J. A. Hickerson.	Grantsburg. Grantsburg. Grantsburg.
Calumet.	Chilton.	Wm. Morrissey, Sup. Ex. George C. Humes.	Chilton. Chilton.
Chippewa.	Chippewa Falls.	E. D. Martin, Sup. Ex. P. T. Favell. M. S. Bailey.	Chippewa Falls. Chippewa Falls. Chippewa Falls.
	Bloomer.	J. A. Morrison. A. J. Newman.	Bloomer. Bloomer.
Clark.	Neillsville.	G. E. Crothers, Sup. Ex. F. W. Draper. Charles F. Grow.	Neillsville. Neillsville. Neillsville.
Columbia.	Portage.	W. G. Clough, Sup. Ex. J. E. Jones. I. A. Kellogg.	Portage. Portage. Portage.
	Columbus.	Fred Thompson, Sup. Ex. G. C. Gism. Thomas Sanderson.	Columbus. Columbus. Rio.
Crawford.	Prairie du Chien		
Dane.	Madison.	Julius E. Olson, Sup. Ex. R. L. Schmedeman. C. E. Buell.	Madison. Madison. Madison.
	Stoughton.	G. O. Banting, Sup. Ex. Ed. Drotning. O. S. Rice.	Stoughton. Stoughton. Deerfield.
	Mt. Horeb.	Guy Ives, Sup. Ex. Michael Johnson. C. I. Brigham.	Black Earth. Mt. Horeb. Blue Mounds.
Dodge.	Mayville.	L. S. Keeley, Sup. Ex. A. Bachhuber. C. W. Lamoreux.	Mayville. Mayville. Mayville.
	Beaver Dam.	James F. Healey, Supt. Ex. F. J. Mirlach. H. B. Drake.	Beaver Dam. Beaver Dam. Beaver Dam.

DIRECTORY OF LOCAL EXAMINERS—Continued.

County.	Examination Center.	Local Examiner.	Post Office.
Door	Sturgeon Bay	Charles G. Stangle, Supt. Ex. J. A. Eichinger	Sturgeon Bay. Sturgeon Bay. Sturgeon Bay.
Douglas	Superior	A. D. S. Gillette, Sup. Ex. W. R. Foley	Superior. Superior. Superior.
	Lake Nebagamon	Victor Linley, Sup. Ex. Henry Butler	Superior. Superior. Superior.
Dunn	Menomonie	George Works, Sup. Ex. John Kelley, Jr.	Menomonie. Menomonie. Colfax.
Eau Claire. .	Eau Claire	W. H. Schulz, Sup. Ex. John B. Fleming	Eau Claire. Eau Claire. Eau Claire.
	Augusta	A. H. Shoemaker	Augusta.
Florence	Florence	John E. Hale, Sup. Ex. G. C. Young	Florence. Florence. Florence.
Fond du Lac..	Fond du Lac	Frank Waring	Fond du Lac. Fond du Lac.
	Waupun	O. H. Ecks, Sup. Ex. F. W. Chadbourne	Ripon. Waupun.
Forest	Crandon	O. J. Marston, Sup. Ex. Dr. T. M. Welch	Crandon. Crandon. N Crandon.
Grant	Platteville	H. A. Kamm, Sup. Ex. Samuel Shaw	Platteville. Platteville. Cuba City.
	Lancaster	John Masbaum	Lancaster. Lancaster. Lancaster.
Green	Monroe	J. A. Wilgus, Sup. Ex. John T. Wilkinson	Monroe. Monroe. Monroe.
		S. E. Smalley	Monroe.
Green Lake..	Dartford.	C. H. Nye, Sup. Ex. E. B. Goodsell	Princeton. Dartford. Berlin.
Iowa	Dodgeville	W. A. Johnson	Dodgeville. Dodgeville. Dodgeville.
Iron	Hurley	J. C. Penn, Sup. Ex. W. F. Trukenbroed	Hurley. Hurley. Hurley.
Jackson	Black River Falls	J. L. Sheron	Bl. River Falls. Bl. River Falls. Bl. River Falls.
Jefferson	Watertown	George V. Kelley, Sup. Ex. S. G. Potter	Watertown. Watertown. Watertown.
	Fort Atkinson...	John J. Wood	Jefferson. Jefferson. Jefferson.

DIRECTORY OF LOCAL EXAMINERS—Continued.

County.	Examination Center.	Local Examiner.	Post Office.
Juneau	Mauston.....	Roll Harrison, Sup. Ex. J. W. Wightman M. L. Bunneil.....	Mauston. Elroy. Mauston.
Kenosha	Kenosha.....	W. J. Hocking, Sup. Ex. John C. Slater..... Albert Buckmaster.....	Kenosha. Kenosha. Kenosha.
Kewaunee.....	Kewaunee.....	W. H. Drissen, Sup. Joseph J. Schultz Fred M. Borgm n	Kewaunee. Kewaunee Kewaunee.
La Crosse.....	La Crosse.....	Harry Spence, Sup. Ex. F. H. Fowler..... Frank Winter.....	La Crosse. La Crosse. La Crosse.
	West Salem.....	B. F. Oltman, Sup. Ex. S. W. Brown..... Elias Jones.....	West Salem. West Salem, Bangor.
La Fayette....	Darlington.....	R. E. Loveland, Sup. Ex. Daniel McConnell..... Dr. D. W. Hogue.....	Darlington Darlington Darlington
Langlade	Antigo.....	C. O. Marsh, Sup. Ex. E. A. Morse..... T. W. Hogan.....	Antigo. Antigo. Antigo.
Lincoln	Merrill.....	Supt. D. E. Roberts, Sup. Ex. George M. Emerich John Brandt.....	Merrill Merrill. Merrill.
Manitowoc ...	Manitowoc.....	F. I. Tangher, Sup. Ex. Archie Nash..... William Rath sack.....	Manitowoc Manitowoc. Manitowoc
	Reedsville.....	Otto Drews..... Joseph Zahorik.....	Manitowoc Cato.
Marathon.....	Edgar.....	John C. Hinrichs, Sup. Ex. C. C. Barrett..... A. N. Whiting.....	Hamburg. Edgar. Marathon.
	Wausau.....	C. M. Boyles, Sup. Ex. Anton Mehl..... S. B. Tobey.....	Wausau. Wausau. Wausau.
Marinette.....	Marinette.....	George H. Gohlke, Sup. Ex. Elmer Grimmer C. R. Johnston	Marinette. Marinette. Marinette.
	Wausaukee.....	R. B. Thiel, Sup. Ex. H. P. Bird..... C. E. Wright	Wausaukee. Wausaukee. Dunbar.
Marquette	Montello.....	J. H. Wheelock, Sup. Ex. A. J. Barry .. M. G. Ellison	Westfield. Montello. Montello.
Milwaukee....	1st Assembly District.	John Finan, Sup. Ex. F. J. Rickert W. E. Van Alten....	Milwaukee. Milwaukee. Milwaukee.
	15th Assembly District.	William F. Sell, Sup. Ex. Otto Schomberg .. A. Gennrich.....	Milwaukee. Milwaukee. Milwaukee.
	18th Assembly District.	F. C. Lau, Sup. Ex. E. F. Pahl..... Peter J. Koehler.....	Milwaukee. Milwaukee. Milwaukee.
	2nd Assembly District.	John Ulrich, Sup. Ex. H. J. Steinmann..... Carl Kuskat.....	Milwaukee Milwaukee. Milwaukee.

DIRECTORY OF LOCAL EXAMINERS—Continued.

County.	Examination Center.	Local Examiner.	Post Office.
Milwaukee ...	6th Assembly District.	Patrick Donnelly, Sup. Ex..... A. N. Fairchild..... T. J. Perles.....	Milwaukee. Milwaukee. Milwaukee.
	4th Assembly District.	I. E. Müller, Sup. Ex..... Rev. H. H. Jacobs..... Adolph Reibrock.....	Milwaukee. Milwaukee. Milwaukee.
	9th Assembly District.	P. Tiefenthaler, Sup. Ex..... G. E. Schultz.....	Milwaukee. Milwaukee.
	12th Assembly District.	William Promberger, Sup. Ex..... Joseph Ewens..... R. S. Witte.....	Milwaukee. Milwaukee. Milwaukee.
	10th Assembly District.	H. P. Fleischer, Sup. Ex..... J. C. Karel..... Theodore Puls.....	Milwaukee. Milwaukee. Milwaukee.
	16th Assembly District.	I. N. Betten, Sup. Ex..... C. Hergarten..... E. Seidel.....	Milwaukee. Milwaukee. Milwaukee.
	Wauwatosa.....	T. B. Lloyd-Jones, Sup. Ex..... A. W. Smith..... F. H. Sporleder.....	Wauwatosa. Wauwatosa. Wauwatosa.
	So Milwaukee..	Paul Bergen, Sup. Ex..... H. G. Disch..... J. P. McGuigan.....	So. Milwaukee. So. Milwaukee. So. Milwaukee.
	14th Assembly District.	C. A. Kriesel, Sup. Ex..... A. N. Gavin..... L. F. Kelpinski.....	Milwaukee. Milwaukee. Milwaukee.
	5th Assembly District.	Henry Krueger, Sup. Ex..... John J. Handley..... Andrew Oswald.....	Milwaukee. Milwaukee. Milwaukee.
	11th Assembly District.	John C. Vogenitz..... Arthur Kienth.....	Milwaukee. Milwaukee.
	8th Assembly District.	Dominic Schuler, Sup. Ex..... W. H. Graebner..... A. C. Manegold.....	Milwaukee. Milwaukee. Milwaukee.
Monroe.....	Sparta.....	C. M. Sanford..... R. H. McCoy..... H. J. Skinner.....	Sparta. Sparta. Sparta.
Oconto.....	Oconto.....	L. C. Harvey, Sup. Ex..... W. H. Young..... Fred Shedler.....	Oconto. Oconto. Oconto.
Oneida.....	Rhineland.....	F. A. Lowell, Sup. Ex..... W. C. Orr..... W. V. Reed.....	Rhineland. Rhineland. Rhineland.
Outagamie.....	Appleton.....	Charles W. Treat, Sup. Ex..... David Hammell..... Humphrey Pierce.....	Appleton. Appleton. Appleton.
	Seymour.....	F. W. Azley, Sup. Ex..... George Falck..... Charles Raught.....	Seymour. Seymour. Kaukauna.
Ozaukee.....	Port Washington	A. A. Blandin, Sup. Ex..... E. R. Smith..... J. E. Uselding.....	Pt. Washington. Pt. Washington. Pt. Washington.
Pepin.....	Durand.....	Lucy Spooner, Sup. Ex..... W. B. Newcomb..... C. A. Ingram.....	Durand. Durand. Durand.
Pierce.....	Ellsworth.....	C. A. Schofield, Sup. Ex..... M. M. Sanderson.....	Ellsworth. Ellsworth.

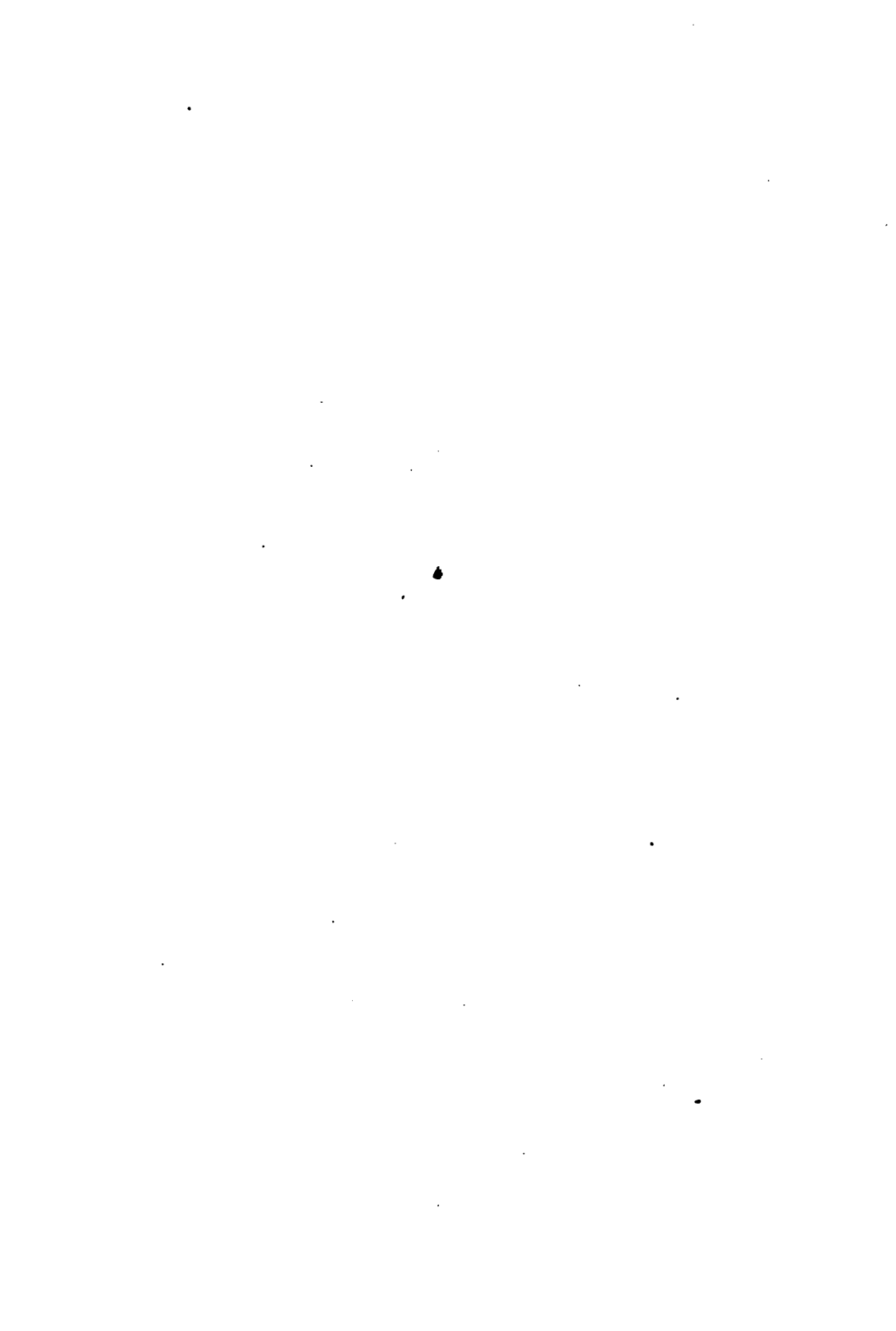
DIRECTORY OF LOCAL EXAMINERS—Continued.

County.	Examination Center.	Local Examiner.	Post Office.
Polk	St. Croix Falls...	C. W. Monty, Sup. Ex..... C. W. Staples..... Dr. F. W. Walker.....	St. Croix Falls. Osceola. St. Croix Falls.
Portage	Stevens Point....	John Karnopp, Sup. Ex..... G. L. Park..... A. E. Redfield.....	Almond. Stevens Point. Stevens Point.
Price.....	Phillips	E. W. Murray, Sup. Ex..... Charles E. Tobey..... Nathan Lane.....	Phillips. Phillips. Phillips.
Racine	Racine	E. M. Blackhurst, S p. Ex..... A. C. Hanson..... W. W. Storms.....	Racine. Racine. Racine.
	Burlington.....	George W. Waller, Sup. Ex..... G. M. Reinhardt..... F. O. Kilpatrick.....	Burlington. Burlington. Chester.
Richland	Richland Center.	Grant Pratt, Sup. Ex..... F. H. Pratt..... Frank Nee.....	Richland Center. Richland Center. Richland Center.
Rock.....	Evansville	A. H. Sholtz, Sup. Ex..... L. Van Wart..... E. M. Richmond.....	Evansville. Evansville. Evansville.
	Janesville.....	John Arbuthnot, Sup. Ex..... M. P. Richardson..... H. J. Cunningham.....	Janesville. Janesville. Janesville.
	Beloit	John C. Peirson, Sup. Ex..... M. E. Northrop..... Donald Van Wort.....	Beloit. Beloit. Beloit.
Rusk.....	Ladysmith.....	W. N. Mackin, Sup. Ex..... L. J. Bischel..... F. E. Munroe.....	Ladysmith. Ladysmith. Ladysmith.
St. Croix.....	Hudson	Dennis Hennessey, Sup. Ex.....	Hudson.
Sauk	Baraboo.....	G. F. Snyder, Sup. Ex..... C. H. Evenson..... R. B. Griggs.....	Reedsburg. Baraboo. Baraboo.
	Spring Green....	Bern. McNulty, Sup. Ex..... Thomas King.....	Spring Green. Spring Green.
Sawyer.....	Hayward.....	William A. Light, Sup. Ex..... Dr. C. L. Story..... R. J. Hennessey.....	Hayward. Hayward. Hayward.
Shawano.....	Shawano	L. D. Roberts, Sup. Ex..... H. W. Partlow..... O. O. Weigand.....	Shawano. Shawano. Shawano.
Sheboygan....	Sheboygan....	H. F. Leverenz, Sup. Ex..... Theo. Dieckmann..... J. C. Elfers.....	Sheboygan. Sheboygan. Sheboygan.
	Plymouth.....	A. C. Kingford, Sup. Ex..... H. C. Bade..... H. J. Bamford.....	Sheboygan Falls. Plymouth. Plymouth.
Taylor	Medford.....	G. W. Adams..... M. A. Buckley.....	Medford. Medford.
Trempealeau..	Whitehall	P. H. Johnson, Sup. Ex..... E. J. Brovold..... J. I. Dewey.....	Whitehall. Etrick. Arcadia.

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DIRECTORY OF LOCAL EXAMINERS—Continued.

County.	Examination Center.	Local Examiner.	Post Office.
Vernon	Viroqua.....	H. L. Gardner, Sup. Ex. Frank Graves	Viroqua. Viroqua.
		J. Henry Bennett.....	Viroqua.
Vilas.....	Eagle River.....	Grant Cook, Sup. Ex..... James Morgan.....	Eagle River. Eagle River.
Walworth.....	Elkhorn.....	John G. Voss, Sup. Ex..... A. C. Beckwith	Elkhorn. Elkhorn.
Washburn	Shell Lake.....	William Kloster, Sup. Ex. J. M. Smith	Shell Lake. Shell Lake.
		J. H. Shields.....	Shell Lake.
Washington...	West Bend.....	D. E. McLane, Sup. Ex..... W. R. Rix	West Bend. West Bend.
Waukesha	Waukesha	S. B. Ray, Sup. Ex..... E. W. Malone	Waukesha. Waukesha.
		D. J. Hemlock	Waukesha.
	Oconomowoc	S. B. Rhoads, Sup. Ex..... W. W. Brown	Hartland. Hartland.
		Charles Probert	Oconomowoc.
Waupaca	Waupaca	W. E. Fisher, Sup. Ex..... Charles Stinchfield.....	Waupaca. Waupaca.
	New London.....	C. B. Stanley, Sup. Ex..... Aug. Pape	New London. New London.
		R. M. Van Doren.....	New London.
Wausara..	Wautoma	Tosten Thompson, Sup. Ex..... T. H. Patterson	Wautoma. Wild Rose.
		G. M. Byse	Wautoma.
Winnebago...	Oshkosh	B. Mack Dresden, Sup. Ex..... C. M. Perry	Oshkosh. Oshkosh.
		D. W. Fernandez	Oshkosh.
	Neenah	E. M. Beeman, Sup. Ex..... J. P. Jasperson.....	Neenah. Neenah.
		P. V. Lawson.....	Menasha.
	Omro	F. E. Sheldon, Sup. Ex..... F. J. Maher.....	Omro. Omro.
Wood	Grand Rapids ..	M. H. Jackson, Sup. Ex..... C. S. Vedder	Grand Rapids. Marshfield.
		Judge J. W. Conway	Grand Rapids.



PART I.

Report of Civil Service Commission

Report of Secretary and Chief Examiner

Report of the Civil Service Commission.

To the Governor:

In conformity to the requirements of law, as well as custom, we have the honor of submitting to you the first biennial report of the Civil Service Commission of the state of Wisconsin. In view of the fact that this is our first report we deem it advisable to outline in some detail the various legislative acts applying the merit system to the civil service of the state and localities.

FIRE AND POLICE BOARDS.

Before the passage of the Warner Civil Service Law of 1895, the merit system was in full and successful operation in our larger municipalities. Two acts had already been passed by previous legislatures, one relating to the fire and police departments of the cities of the second and third classes, and the other relating to the city of Milwaukee. It will thus be observed the Civil Service law of last winter accepted and applied to the state service the principles of the merit system which were in successful operation in the more important departments of our principal cities.

It is scarcely within the province of this report to discuss at length the operation of the law creating the fire and police boards of the cities of the second and third classes. Suffice it to say that this law applies to some eighteen cities of the state possessing a population above ten thousand. The law was passed in 1897 and amended in 1899. The principles applied to the organization of these boards are essentially the same as employed in the organization of all civil service boards. They are non-partisan in their character and are given the power of preparing eligible lists for the fire and police departments together

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with the power of framing rules and regulations governing examinations and promotions. An investigation of the operations of this law was recently made by one of the members of the Commission, and it was found that almost invariably a decided improvement and upbuilding of these two departments have followed since the creation of these local boards, and that appointments for political reasons have, in most instances, practically ceased. Under the merit system sobriety and discipline have followed and official honor and duty now vitalize the work of these two branches of the city government.

In the city of Milwaukee two civil service boards exist, the fire and police boards, as noted above, and a civil service commission which has the jurisdiction over the remaining departments of the city government. Naturally, the administration of the merit system in Milwaukee is confronted with far greater difficulties than in the other cities of the state, but, after making due allowance for the efforts that have been made to discredit the system, the evidence indicates that in the main it has worked well.

While there is no intention to urge Civil Service legislation for the cities of the state, still it is not improper at this time to suggest that the increasing growth of our municipalities will in the near future warrant the application of the merit system to the selection of all municipal employees.

The most natural and logical way in which to accomplish this is to reorganize the Fire and Police Commissioners into Municipal Civil Service Commissions and to extend their jurisdiction to all municipal employees. And then, as in New York, unify the work of all these municipal commissions by placing them under the jurisdiction of the State Civil Service Commission with restricted supervision.

MERIT SYSTEM AND MILITIA OFFICERS.

In 1905 the state legislature passed three civil service acts which applied the merit system to the state service. One of these acts pertains to the selection and promotion of the officials

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of the Wisconsin National Guard and incorporates the main features of the federal service governing the selection of officers. Two features of this act that should be noted in this place are, first, the method of appointment and promotion of the staff officers which secures a permanent service, and acknowledges the principles of promotion; second, the creation of a school of military instruction. This plan involves, first a school of correspondence based upon the United States army regulations and texts used in the regular service and covers the five different branches of military service, administration, infantry, artillery, cavalry and medical. This school of correspondence is compulsory. The second feature is an annual school of instruction the attendance upon which is also compulsory. With the information acquired through the systematic reading of the literature directed by correspondence the officers are brought together annually and instructed through lectures and in other ways by national and state military officers. This tends to build up and maintain the efficiency of the Wisconsin National guard and is a gratifying instance of the high regard for the merit system entertained by the adjutant general's department.

LEGISLATIVE EMPLOYES.

Another act passed by the legislature is of special interest for the reason that it is a contribution to civil service legislation. The law placing the selection of the more technical positions of the legislature under the jurisdiction of the Civil Service Commission is without a parallel. The Wisconsin legislature, we believe, broke new ground. The conditions controlling the selection of legislative positions in Wisconsin were not essentially different from those of other states, but the temper of the legislature was for the introduction of better things, and that if the merit system was beneficial for the state administrative departments it would prove equally beneficial in the selection of legislative positions.

As a result, the legislature passed a law reducing the number of employees, requiring full hours of service, permitting

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the employment of men only, and finally, requiring the preparation of eligible lists by competitive examinations for these positions by the Civil Service Commission. We have here an act unique and far reaching in its designs. It was unquestionably the intention of the legislature to apply the merit system to all legislative positions of a clerical character, but unfortunately the law was loosely drawn, and upon interpretation the Attorney General held that it applied only to stenographic and clerical positions. But even with this limitation the law includes the more important technical positions, such as stenographers and typewriters, and will tend to relieve the members of the legislature from the constant pressure of office seekers incident to every legislative session. Great credit is due the Wisconsin legislature for this step. It was wholly upon its own initiative, unheralded and unexpected, and came, as we understand, as an afterthought on the part of the friends of the merit principle.

SOURCES OF STATE CIVIL SERVICE REFORM

We may now outline the leading provisions of the act known as the Civil Service Law. The sources of this act were derived from the federal civil service law, the laws of Massachusetts, and particularly New York. Some improvements were incorporated in the Wisconsin act as the result of experience of other states, supported by the opinions of men who have given thought and attention to this kind of legislation. The Wisconsin law is far more detailed in its provisions than similar laws of other states. The legislature not only put into the law the essential provisions of the laws of other states, but also incorporated the more important provisions of the rules and regulations framed by the state commissions. The Wisconsin act incorporates therefore, those provisions found most valuable in the administration of the merit system as worked out in New York, Massachusetts and the federal service, as well as new points of view suggested by civil service experts. As a result, in many respects, the Wisconsin law is self-operating, and even were rules not framed by the Commission, the law would still embody a

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merit system, fairly safeguarded and protected from political manipulation and collusion.

EXAMINATION OF FORMER EMPLOYEES

One exceptional feature was incorporated in the Wisconsin act. We refer to the provision requiring a non-competitive examination of the employes in the service at the time the law was passed. The accompanying table (Part 3) shows the results of this examination. The examination was required of all employes in the competitive class as a condition for continuing in the service of the state longer than June 14, 1906. Naturally, great weight was given to the judgment of the heads of the various departments under whom the employes served. In fact, this formed the main element in determining the right of the old employe to continue in the service. The Commission felt that a failure to pass a written examination ought not to disqualify an employe whose work, in the judgment of his superior, was thoroughly satisfactory.

In marking the papers of the original employes the rule of law governing promotional examinations was applied. This rule provides that promotions shall be based upon merit and fitness, with due consideration for seniority and experience. Guided by this rule which seemed to indicate clearly the legislative intent with reference to the examination of persons in the service at the time the Civil Service law was passed, the heads of departments were required to indicate the standing of their employes as to conduct, habits, initiative, quality and quantity of work, punctuality, obedience and attendance.

In some instances these reports of the heads of departments were not discriminating and, consequently, of little value to the Commission. For instance, one department reported all employes as perfect. And yet, in the main, it is true that where the heads of departments presented satisfactory evidence of faithful work, the Commission did not retire the employe because he failed to pass the written examination. Retirements were made only in those cases where the report of the heads of

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departments indicated a neglect of duty or incompetency on the part of the employe.

STATE INSTITUTIONS

The non-competitive examination was not required by law of the employes of the state charitable and penal institutions. In fact, these institutions were treated in some respects, in an exceptional way. For some years Wisconsin has taken a front place in the administration of her state institutions, and it was felt that for special reasons these institutions should be exempted from the non-competitive examination. It was urged that the merit system already prevailed in these institutions, and in view of that fact the present conditions ought not to be disturbed. Thus compromise features affecting the state institutions were incorporated in the law, the most important of which were the exemption of the employes from the non-competitive examination, the right of the Board of Control to make its own classification of employes, and finally, its power to dismiss an employe without a statement of the reasons in writing to the Civil Service Commission.

RULES AND REGULATIONS

In view of the detailed nature of the Wisconsin act, the Commission found some difficulty in framing its rules and regulations. It was felt that for the convenience of the appointing officers, employes and the public, that rules and regulations should be prepared, dealing with matters contained in the law itself. It was found that it was difficult to reproduce in exact language the principles covered by the act. In the main the rules and regulations framed by the Commission relate to details of organization and the classifications of positions for the purpose of examination and certification.

It was found, however, that the provisions of the law relating to a given subject were scattered throughout its various sections, and consequently, it was felt that a systematic grouping of all the provisions relating to a given subject under topical

General Report of the Commission.

heads would be of great assistance not only to the Commission, but also to the appointing officers and the public. So it will be observed that the rules are made up of two parts. In smaller print will be found the exact language and section of the law relating to a single subject, and in larger print will be found the rules framed by the Commission to supplement the law, in case the statute did not fully cover the requirements of the situation.

CLASSIFICATION

One of the most important tasks before the commission in framing the rules and regulations relate to the classification of the positions for the purpose of examination and certification. The statute lays the foundations of this classification. The entire state service is first divided into the CLASSIFIED and UNCLASSIFIED service. Obviously the purpose of this division was to determine the positions that should be excluded from the jurisdiction of the Civil Service Commission. In the main, these included the judges of the courts, elective officers, the members of boards or commissions, officers appointed directly by the Governor, and the teaching staffs of the University and State Normal schools.

EXEMPT CLASS

The classified service particularly concerns the Civil Service Commission. This is divided by the law into the exempt, non-competitive, competitive and labor classes. The legislature then placed certain positions of a confidential character in the exempt class. These were the deputies, secretaries, and one stenographer for each officer and commission. Over these positions the Commission has no jurisdiction.

Not only was the legislature conservative in its exemptions but it prescribed in detail the procedure which the Commission must follow in permitting exemptions in the future. The law has given the Commission full power to make exemptions when,

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in its judgment, the service would thereby be benefited, but, on the other hand, it is not the intention of the law that these should be liberally made. In conformity with this view the Commission has been exceedingly conservative in making exemptions.

In the first place there are two kinds of exemptions provided for:—the exemption of the position, and the exemption of the person. The law prohibits the Commission from placing any position or person in the exempt class without first advertising a public hearing to which any citizen may come and oppose or support the proposed exemption, and the action of the Commission must be approved by the Governor. The distinction between the exemption of the position, and of the person is to enable the Commission to exempt certain persons from examination, and at the same time preserve its control over the selection of such persons in the future. This provision applies especially to professional and technical positions. Thus it will be seen that a loophole which has been so fruitful in defeating the merit system elsewhere, is amply closed by the Wisconsin act.

We are confident that a perusal of the reasons for exemptions, found in this report (Part 2) will indicate that our action in this respect has been amply justified. Some of the exemptions were granted because it was necessary to go outside the state for persons to fill certain positions of a technical character, but more particularly reasons of economy and special fitness governed our actions in most cases. The Commission did not grant the request for exemptions in all cases. In some instances, the person, and not the position was exempted. This leaves the Commission in control of these positions in the future. In some instances, the positions were placed in the non-competitive instead of the exempt class. In this way, the merit system is protected in case any attempt is made to fill the position for other reasons than fitness. We confidently feel that the spirit of the law on exemptions has been closely followed. Some slight difficulties arose on the question of exemptions, but this was due to a misunderstanding of the law by appointing officers. In some cases the commission was embarrassed by requests for ex-

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emptions after the person had been selected, but a fuller knowledge of the law on the part of the appointing officers will doubtless remove such complications in the future.

NON-COMPETITIVE CLASS

The purpose of the non-competitive class is to enable the Commission to meet exceptional cases where the reasons for exemptions are not present. The positions are those requiring persons of peculiar or special qualifications which can not be readily discovered by competitive examinations. By placing the position in the non-competitive class, the appointing officer may nominate a person for the place subject to a non-competitive examination. The commission has adopted a conservative policy in regard to requests for the classification of positions in the non-competitive class, as an examination of (part 2) of this report will indicate.

COMPETITIVE CLASS

The competitive class includes by far the largest number of positions. It is the intention of the law that this great class shall be kept intact except where special reasons warrant the Commission in transferring the position to the exempt or non-competitive classes.

Obviously, the greatest task confronting the Commission in dealing with the competitive class was to classify the positions so that proper examinations could be given and suitable eligible lists prepared. It was necessary to reduce a large number of positions of varied duties to convenient groups. The difficulties were in many cases increased by the fact that the conditions of tenure make it advisable to select persons who are residents of the locality where the service is to be rendered. This is true especially of game wardens and oil inspectors. In these cases eligible lists must be prepared for special districts.

Most of the positions, however, are classified according to the character of the duties without regard to location (Part 7). The primary aim is to secure an eligible list from which certifications

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can be made with assurances of securing persons of fitness and capacity. On the other hand, classifications should not be carried so far as to unduly burden the examining machinery of the Commission. By a classification according to duties, proper certifications can be made and the rights of the eligibles fully protected.

The policy of the examinations is important in the treatment of the competitive class. A perusal of the secretary's report to this Commission will show that the examinations have been prepared with a view to practical tests in every instance. The object has been at all times to ascertain the duties of the position or class of positions and prepare the examinations accordingly. Another element of great importance in determining the fitness of the applicant to go on the eligible list is that of his previous experience and training. This must necessarily be an important element in the examination. The educational value of the merit system in public service is significant. The fact that any applicant can take the examination with the feeling that he will receive fair treatment is a force of tremendous significance for the cultivation of right civic ideals in the state. The tendency everywhere is toward efficiency in government. The application of the merit system is but one of the steps in this direction.

LABOR

A large number of unskilled positions are placed in the labor class. The Wisconsin law does not subject unskilled labor to a competitive examination, and the Commission merely requires the filling out of an application blank showing good habits and ability to work. In order to make the eligible lists effective the laborer is required to designate his preference of the kind of work he desires, and upon the basis of his application blank is determined his fitness to go on the eligible list. In order that the better laborers might secure their proper places upon the eligible list it was decided to divide the labor classes into two grades; grade A to include those laborers whose application

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blanks entitled them to a standing of "good," and grade B to include those whose preliminary papers entitled them to go on the eligible list and who rank below good. For instance, when a laborer applies to the Commission, he indicates upon his application blank whether he desires a position as farmer, painter or common laborer and then, on the basis of his application it is determined whether he should go in grade A or B and is placed upon the eligible list accordingly.

PROMOTIONS AND TRANSFERS

The rules relating to promotion need some explanation. The Civil Service Law places special emphasis upon promotions. Under the law there are two elements which determine promotions, first, a change of duty and second, an increase in salary. The difficulty in framing the rules for promotions appeared in the fact that departments as a rule are too small to provide any well marked gradations of clerical service. On the other hand, it was felt that a mere increase in salary without a change in duty and responsibility was not always a good basis for promotion, but the law requires the Commission to consider this a sufficient reason.

The most important feature of the rules for promotion is the classification of the employes in each department into two grades—the executive and ordinary clerical positions. The executive positions include those employes exercising considerable responsibility while the lower grades include those of a clerical nature only. The purpose of this classification was to provide for the future. It was felt that if promotions to higher positions were made from the lower clerical positions alone, the efficiency of the departments might be impaired because the small salary of the lower positions would frequently attract young and immature persons who might make good clerks, but who might not have sufficient experience and capacity for service in the higher or executive positions. The Commission felt that the chief clerical positions should be open to the competition of persons on the outside of the department, it being assumed that the clerk in the

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department having the capacity and experience to entitle him to service in the higher positions would be able to compete successfully with those on the outside of the service by reason of his familiarity with the work of the department. A person may be an excellent clerk in a subordinate place, and still be unfit to assume the responsibilities of a position requiring the exercise of executive talent.

Another reason also influenced the Commission in coming to this conclusion: it was felt that the lower positions of the state service did not afford sufficient inducement from the point of view of salary and opportunity to keep the employe in the service for any length of time. If the lower grade clerkships were filled with young and active persons who would remain in the service until their experience enabled them to obtain in business or elsewhere positions more remunerative, and in keeping with their ability and training, a higher degree of efficiency in the public service would be obtained.

REMOVALS

The provisions of the law relating to removals has lead to some misunderstanding. It was not altogether clear as to the power of the Commission over removals. The law provides that these may be made for cause other than political or religious, and that a statement of reasons for dismissal must be given to the person dismissed, and a copy filed with the office of the Commission. Presumably, this will permit of an answer on the part of the person removed.

The opinion of the Attorney General of the state was requested as to the power of the Commission to inquire into and pass upon the sufficiency of the reasons for removal. It is the opinion of the Attorney General (Part 5) that the Civil Service Commission has no power to intercede and reinstate the person removed. It is held that the Commission is an administrative, and not a judicial body. Furthermore, any action of the Commission, looking to the reinstatement of the person dismissed, would tend to destroy that harmony in the department so necessary to efficient administration.

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The check upon any hasty and ill-considered removals is found in the fact that the appointing officer must come to the eligible list for a certification of persons qualified for the position in question, or in case he desires to fill the position by promotion or transfer from another department, the Commission is made a party to the change. Again, the appointing officers are not likely to exercise this power without good cause, and in case of any abuse of this power, publicity on the one hand, and the fact that he must come to the eligible list, on the other hand, are ample checks upon any unjust exercise of the power of dismissal. The law places the responsibility fully upon the appointing officer. This enforces loyalty on the part of the employes in the departments, and eliminates any outside influence which might tend to destroy this.

The power of the Commission is thus limited to the preparation of eligible lists on the basis of fitness, and is not given the power of judicial review in the case of removals. If the statement of reasons for removals is not political or religious, and, *on its face*, constitutes a just cause, it is not within the power of the Commission to go back of this statement. The aggrieved person has a remedy before the courts in a writ of mandamus.

There is no life tenure in the Civil Service. On the other hand, the whole service is predicated on the principle of the merit tenure. It is only during the period of efficiency that the applicant is safeguarded in his position. The employe removed may present his defense in writing, but it does not necessarily involve a hearing before the Commission.

The merit principle which operates in business is a just and efficient principle to apply to public service. The tenure is as permanent as the rules of efficiency require. We have retirements from the public service where the opportunities and salaries outside of the service are greater than those within the service. This interpretation of the statute permitting the heads of the departments to remove for just cause will obviate the adoption of a legislative policy of old age retirement.

The Wisconsin law upon removals, as interpreted by the Attorney General, is in harmony with President Roosevelt's order

General Report of the Commission.

affecting removals in the Federal service. Furthermore, it is in harmony with the views of those who have watched the experiences and results of the system which gives to the Civil Service Commission the power to review the facts leading up to the removal, and to determine whether the employe has been legally removed. The Federal and Wisconsin practice will enable the Civil Service Commission to protect the merit principle without destroying the *esprit de corps* of the service, which is not equally true where hearings are necessary to removals.

HEARINGS

With one exception, the hearings before the Commission have been confined to requests for a reclassification of certain positions with a view to placing them in the exempt or non-competitive classes. These hearings are summarized in another place (See part 2).

One other hearing relating to the removal of an oil inspector, and the appointment of another person in his place, was held by the Commission. The case centered upon interpretation of certain provisions of the civil service law, and the Commission held that it had no jurisdiction over the controversy on the ground that the courts must interpret the law. Before taking this view, the opinion of the Attorney General was requested as to the powers of the Commission in the premises. This involved the question as to when the law went into full force. Upon this point it was held that the law did not go into full effect until December 16th, 1905, and that during this interval of six months, from June 14th to December 16th, the Commission's powers were limited to the preparation of rules and regulations covering the classification of positions necessary to the full application of the law (See part 5).

It was held that during this interval the appointing power was free to make such changes in the service as was deemed advisable without going to the eligible lists of the Civil Service Commission. The case was taken to the circuit court.

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POLITICAL ACTIVITY AND ASSESSMENTS

The provisions of the law relating to political activity and assessment have led to some misunderstanding. These provisions are directed to the entire service, and fall outside of the jurisdiction of the Commission, except in so far as it is in a position to warn employes who are inclined to engage in political activity. Any attempt to assess political employes is deemed a misdemeanor under the law, and punishable accordingly.

In view of the fact that most of the employes now serving in the departments were appointed for political and personal reasons, it is especially gratifying to note that so far as the knowledge of the Commission goes there has been exceedingly little political activity on the part of those under civil service rules. The spirit of the law has been generally observed, both by appointing officers and employes. The same is true in regard to political assessments. So far as the Commission is aware there has been no attempt to levy assessments on employes. If this has been done, it is without the knowledge of the Commission.

It is felt that in the future political activity on the part of the employes will be still further minimized, and that the spirit of the law in this regard will be fully observed. The Commission has endeavored to cultivate a proper regard for the law in this respect, and the attitude of the employees is to be generally commended.

Naturally during the primary campaign, and at the general election, the Commission was called upon to define the term "political activity." As a result an opinion of the Attorney General was requested, bearing upon this subject. It was held (See part 5) that "political service" as used in the law, was the performance of labor for the advancement of candidates for office, and that no definition could be laid down covering all conditions, but that the specific conditions would govern. It was held that the circulation of a nomination paper was the performance of political service. It was also pointed out that it was not the intention of the law to abridge the rights of citizenship and that

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employees of the state retain the right to express their opinions on political subjects, and even their preference for candidates for office.

LEGAL OPINIONS AND DECISIONS.

Naturally, in the application of the law, the Commission was confronted with some difficulties of a legal nature. As a result the Attorney General of the state was requested on these cases. These opinions are printed in full in Part 5 of this report.

The more important opinions may be briefly summarized.

The question arose as to the power of appointment when the governor was made a party to the appointment. The Attorney General held that where the governor is given the appointing power, with the approval of the head of the department, the position falls in the unclassified service. On the other hand, where the head of the department has the initiative in making the appointment, with the approval of the governor, the position falls in the classified service and must be filled by competitive examinations.

A similar difficulty arose as to what constituted an appointing officer in certain cases. It was held that appointing officers "are those who are authorized by law to appoint their subordinates" and does not apply to those officers who may be deputized by their superiors to make appointments.

Under the law, the Board of Control was given a special power to classify positions under its jurisdiction. The question arose as to whether the Board of Control could make a classification independent of the rules governing the classification of the positions of other departments. The Attorney General held that while the Board of Control possessed the power of making its own classification, still it must be exercised in accordance with the rules governing the classification of positions in other departments.

An important opinion relating to dismissals held that the power of dismissal rested with the appointing officer, and that the law did not give the Commission the power to annul his de-

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cision, or reinstate the dismissed person, except when the removal was made for political or religious reasons, or that "on its face" the reasons were not sufficient. The significance of this decision is discussed more fully elsewhere.

Under the power to make exemptions the question arose as to whether the Commission could temporarily place in the exempt class a given position retaining the power to reclassify the position if deemed advisable. It was held that the Commission had this power.

The more important points covered by the opinions of the Attorney General are discussed elsewhere in this report.

The Civil Service law has not been passed upon by the supreme court of the state except upon one point. This issue arose out of an interpretation of the provision of the law relating to exemptions. In all other instances the positions which the legislature desired to exempt were named specifically, and placed in the exempt class. But in the case of Bank Examiner's department instead of specifically exempting it, all departments requiring a two-thirds vote of the legislature to create were exempted. The Attorney General held that this constitutional provision did not require a two-thirds vote of both houses to create and organize an administrative supervision, but pertained to the enactment of laws governing the internal organization of banks relating to deposits, reserves, etc., and that the legislature did not accomplish its purpose.

The issue was brought directly before the supreme court in a friendly suit in order to secure a final interpretation of the provision in dispute. The court held (See part 5) that the intent of the legislature was to exempt the Bank Examiner's department because no other department is affected by the constitutional provision in question.

The court did not cover the question of expediency but decided only a law point. The best evidence strongly indicates that the bankers of the state favor the application of the merit system of the Bank Examiner's department. If there is any one branch of the public service that should be removed from the pressure of politics, it is this department. There is no ques-

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tion of the ability of the Civil Service Commission to secure excellently qualified persons for the work of that office.

LOCAL EXAMINERS

One of the primary purposes of this act is to make it easy and inexpensive for all applicants to take the examinations. For this reason it was provided that examinations should be held in each assembly district of the state, and where an assembly district was made up of more than one county an examination should be held at each county seat in that district.

This necessitated the organization of local examining boards to conduct these examinations. It was impossible for the office at Madison to do this work for the reason that the examinations must be held in most instances at the same time. As a result the Commission decided to create a board of local examiners for each examination center. The selection of the place for holding the examinations was determined largely with reference to transportation facilities. At each place, upon recommendation of members of the legislature for each assembly district, co-operating with the senator, an examining board of three members was created. In almost every instance a schoolman, familiar with holding examinations, was made one of the members. The law did not empower the Committee to compensate the local examiners for their work and as a result actual expenses only have been allowed. While the labors of the office of the Commission will be to some extent increased yet we believe, however, that this feature of the law is to be commended. The expenditure of a few dollars in going to some point to take an examination with the possibility of a failure in passing or of never being certified would prevent much material from competing. Through this provision a body of three hundred thirty persons in different parts of the state is rendering excellent and enthusiastic service to the Commission in conducting the examinations and in giving other valuable assistance in making up the eligible lists. One member of the local board of examiners is designated as the local supervising examiner, and is in

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almost every instance a schoolman. The local examiners receive no compensation, but have accepted as a matter of citizenship. In fact, it is quite surprising as well as gratifying to note the number of influential men who have accepted appointments to the local examining boards.

EXPENSES

The legislative appropriation of ten thousand dollars (\$10,000) per annum to meet the expenses of the Commission is ample although the period covered by this report involved unusual labors. There were unusual expenses of a clerical nature in organizing the office of the Commission, but more especially in conducting the non-competitive examinations for the employees who were in the state service at the time the law was passed. In the secretary's report to the Commission will be found an itemized statement of the expenses for the fiscal year ending June 30, 1906. It will be observed that aside from the per diem salaries, and expenses of the Commission and the Secretary, the principal expenses are for extra stenographic and clerical help, and for readers of examination papers.

We desire, however, to call your attention to another phase of the question of expenses. From the point of view of the state, there is no doubt that the work of the Commission has resulted in economy. This has been brought about in three ways. In the first place it has insured to the state the time, energy and attention of many employees, who in certain seasons would doubtless have been away from their departments engaged in political work. A casual comparison of the departments, before and after the Civil Service Law was passed, by any one familiar with both conditions would furnish ample evidence of the changed situation, and would indicate the greater attentiveness and efficiency of the employees. This will increase in the future. It means more and better work. It is a positive economy.

In the second place the power of the Commission to certify to all pay rolls before they can be paid has in many cases prevented the padding of the roster. There are times when the

appointing officer is urged for political and personal reasons to take on certain persons when, in fact, they are not needed in the work of the department. The fact that irregular appointments can be detected by the Commission, and that a refusal to certify to these throws the expense on the appointing officer without relief, has saved the state a considerable sum of money. In addition, the fact that the appointing officer must come to the eligible lists of the Commission for his applicants still further acts as a deterring factor in making unnecessary appointments. It removes the pressure of personal and political reasons for making such appointments, and has resulted in a positive saving to the state.

A third economy has resulted in saving the time and thought of the appointing officer for the work of his office, undisturbed by the petty annoyances of office seekers. In some of the departments a considerable correspondence has been concerned with the applications for places in the state services.

While it is not possible to reduce to a financial statement the economies due to the operation of the Civil Service law in these respects, it is nevertheless obvious that a great saving of time and energy on the part of the appointing officers is made by reason of the relief which it gives to them in the selection of employees. It is beyond dispute that considerable time and energy were given by the appointing officer to correspondence, and in passing upon the qualifications of applicants for places in their departments. The Civil Service law relieves them from political embarrassment, as well as safeguards them from the necessity of attending to these matters.

DISTRIBUTION OF APPLICANTS AND APPOINTEES

The tables presented by the Secretary (see Part 3) show that the applicants and appointees are widely distributed throughout the state. This is doubtless due to the ease with which the applicants can take the examination by reason of examination centers. A comparison of the geographical distribution of applicants and appointees under Civil Service rules

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compare most favorably with the same distribution before the Civil Service law went into effect. It was generally urged that previous to this the appointments were concentrated in certain localities. Whatever truth this observation may contain it is gratifying to know that all parts of the state are now well represented, and a condition which has followed naturally, and without any conscious attempt to bring it about on the part of the Commission. It is due to the large number of examination centers, and the desire of many citizens to secure positions in the state service.

One interesting and valuable fact has resulted from the experience of the Commission in securing its eligible lists. It has been generally asserted, and with some show of plausibility, that the Commission could never succeed in interesting the proper talent in the high grade positions. On this ground many exemptions were urged and the Commission was in doubt as to what policy should be pursued. And while our experience has been limited, still it is sufficient to reassure us in the attitude taken that well qualified persons would compete for the high grade positions. In fact we have had the opposite experience. We have had more difficulty in securing eligibles for the low than for the high grade positions. Every examination for the high grade position has called forth a large number of good applicants where the salary was commensurate with the duties and responsibilities of the position. In fact the salary is the key to the situation, and will determine in most instances the character of the applicants

VETERAN CLAUSE

The Civil Service law of Wisconsin is not as liberal toward the veterans of the Civil War as the similar laws of Massachusetts and New York. But the provision of the law received the approval of those high in the councils of the veterans. The law extends to the Commission the power to grant veterans certain considerations. As a result the Commission has ruled that when a veteran of the Civil War secures a place

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on the eligible list to his marking shall be added five per cent. (5 %). This puts his name in a more favorable place on the list of eligibles.

CONFIDENTIAL RELATIONS

Considerable emphasis by appointing officers has been laid upon the contention that certain positions are of a confidential character, and consequently should be exempt. It appeared to the Commission that this assumption is in most cases entirely unwarranted. Every position carries with it a certain degree of confidence and secrecy. At least, official affairs should not be discussed in public places.

But still, very little public business is of a strictly confidential nature. The only truth in the contention lies in the fact that the employes shall be loyal to the instructions of his supervising officer. The work of a stenographer is probably the most confidential of all public employments. Any stenographer who would divulge office affairs could not long continue in any position of trust.

It is urged that financial positions are peculiarly confidential. This contention has little foundation. The checks in our public service are such that any violation of confidence, or any failure to observe the rules of official propriety, would be readily discovered, and would lead to speedy dismissal. The aim is to secure efficiency and official rectitude in the discharge of the public business, and these qualities can be obtained quite as readily through competitive examinations as through personal appointments. There is very little public business that is so secret and confidential as to require exemptions from competitive examinations. Public business is public not private, and exemptions of positions on the ground that the official relationship is confidential, leads quite as often to INEFFICIENCY and COLLUSION, as it does to conditions that promote the welfare of the service, and safeguard the public interest. It would indeed be a rare occurrence to find a person so void of honor or loyalty as to violate any confidence that might spring from his relationship with his superior officer.

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A recent investigation of defalcations and embezzlements in the Federal Service was undertaken in order to ascertain which branch of the Federal Service, namely: those appointed without competitive examination, or those under Civil Service rules, was more guilty of these offences. The results of this investigation show that a much larger percentage of persons appointed outside of the Civil Service rules have embezzled and defaulted than those appointed from the eligible lists of the Civil Service Commission.

These statistics are significant because of the contention that the safest method of securing honest officials in especially responsible positions is to permit the appointing officer to select them unhampered by Civil Service rules. Investigation shows that this position is not tenable.

ORGANIZATION OF THE WORK.

The law makes provision for a secretary and stenographer, and left the Commission to employ such additional help as the work required. The Wisconsin law is based upon a different theory apparently than the laws of other states. In those states possessing Civil Service Commissions, the members are highly salaried, and are obviously expected to give large attention to the work of the office.

The Wisconsin Commission on the other hand only receives a nominal per diem compensation, and is limited to one hundred days of service. Naturally the clerical work of the office must be supervised by the Secretary, leaving to the Commission the questions of general policy. For this reason the Commission gave particular attention to the selection of its office force, realizing that many delicate questions involving the Commission collectively and individually, would arise daily which the Commission could not promptly consider. If the work of the Civil Service Commission is to be successful, ABSOLUTE FAIRNESS must pervade its examinations and certifications. Alertness must be exercised in detecting any attempt to evade the law. For this reason the position of Secretary to the Commission is one of peculiar delicacy, requiring the exercise of the greatest care in meeting daily questions. The work of the office involves a mass

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of details which must be thoroughly systematized. It is with pleasure that the Commission commends the administration of its Secretary, Mr. F. E. Doty.

RECOMMENDATIONS.

Our work has, so far, covered a transitional period from the regime of filling offices for personal and political reasons to a policy of filling them on a basis of merit. Our policy is now assuming a normal and stable condition, and the period of readjustment is well nigh over.

The Commission has experienced no difficulty in carrying out the provisions of the law in reference to certifications. By reason of our position certain facts in regard to the service as a whole have come to our attention, and to which we desire briefly to refer.

In the first place, a casual examination will indicate that some of the departments are not amply provided for in the way of employees, and that in order to perform satisfactorily the work of the departments it has been found necessary to change the employes from the work as indicated by their titles, to entirely different duties (appendix ———). For instance, in some of the departments persons perform the duties of clerk and stenographer, while legally holding the position of janitor or messenger.

In the second place there seems to be no well defined principle of compensation in the state service. Positions of similar grades receive in the various departments wide differences in salary. In some instances persons receiving low salaries are worked to full capacity, while those receiving high salaries may be doing merely a nominal service. Because of the direct bearing of these two conditions upon the work of this Commission, we desire to suggest that a readjustment of the work and salaries in some of the departments would lead to a greater efficiency and economy in the service as a whole. These discrepancies frequently occur in the state service, and are the result of legislation of long standing, and to the rapid growth of business in

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these departments. These conditions can be easily remedied by a reorganization.

The Civil Service law covers so completely, and guards so thoroughly, the merit principle that there is little to suggest in the way of its improvement. One or two changes, however, might be suggested at this time. These relate mainly to the local examiners. We heartily agree with the provision of the law establishing a large number of local examining points throughout the state. It affords the applicants an opportunity to take the examination without great expense and loss of time.

It has, however, occurred to the Commission that the same objects could be secured by reducing the number of examination centers. In all probability, an examination held at each county seat, or in each senatorial district would amply serve all interests, and at the same time be more economical to the state.

While the Commission has the power to compensate the local examiners for their work in conducting the local examinations, the appropriation given to the Commission is not sufficient to enable it to do this. By reducing the number of local examining points, however, a reasonable per diem allowance could be given the local examiners. We are of opinion that this is advisable.

One of the serious questions before the Commission in its current work is to get the information concerning the examinations effectively before the public. Our experience indicates that this can be more effectively done through the newspapers of the state than by means of the posters. In view of this fact, we would recommend a small additional appropriation for the purpose of thoroughly advertising the examinations.

We desire to call your attention to the lack of uniformity in the state service in regard to length of time granted to employees for sickness. It has occurred to this Commission that the statute should be explicit on this subject. Instances have come to our attention of the granting of sick leaves on full pay for several months. Since we must certify to these pay rolls we have a direct interest in this question. Whatever the law may be, a loose practice has grown up in the various departments in regard to sick leave. A reasonable limit should be assigned by statute and not

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left wholly to the judgment of the heads of the departments. We would suggest that a maximum limit for sick leaves be fixed by statute in addition to the regular vacations allowed to the employes by each department.

These suggestions are not especially vital to the working of the law as a whole. In fact, we know of no changes in the law itself at this time that are essential to its working. Further experience may reveal needed legislation.

RECOGNITION

In closing, we desire to express to the appointing officers our appreciation of the assistance and co-operation rendered us in putting the Civil Service Law into operation. In almost every respect they have given us the most cordial co-operation, and as a result, have removed many difficulties that we might have encountered.

We desire also to acknowledge the helpful suggestions of the State Civil Service and the National Civil Service Reform Associations in the preparation of the rules, and in the solution of technical points arising in the administration of the law.

Especially do we desire to express our appreciation of the assistance rendered us by the local examiners throughout the state. Serving without compensation, they have loyally and generously given their time and careful attention to the supervision of the examinations in their districts, and have also rendered valuable service in furnishing desirable information concerning the qualifications of applicants for positions in the state service.

The state press has also rendered us valuable aid in giving publicity to our examinations. Without this generous assistance it would be difficult for the Commission to reach all parts of the state, and to make widely known the information concerning vacancies in the service.

Respectfully submitted,

S. E. SPARLING,
T. J. CUNNINGHAM,
OTTO GAFFRON.

Report of Secretary and Chief Examiner.

Report of Secretary and Chief Examiner.

MADISON, WIS., DECEMBER 1, 1906.

To the State Civil Service Commission:

GENTLEMEN: I have the honor, at your direction, to submit the following report for the year ending December 1, 1906. The Civil Service Law has been in practical operation since the formal adoption of your rules and regulations on December 15th, 1905, a period of less than one year. During that time the machinery for which the law provides, has been gradually adjusted to the needs of the various departments and institutions affected by it. This process of adjustment is by no means completed, and this report must necessarily be taken merely as a report of progress.

Early in December preparation was made for the competitive examination of candidates for positions in the classified service and also for the non-competitive examination required by law of original employees. Since that time four general competitive examinations have been held. The first was held on January 6, 1906; the second on March 10th; the third on June 16; and the fourth on September 22nd. In addition to these four general competitive examinations the department has examined 366 original employees in the competitive class entitled to noncompetitive examination, and has held two general competitive examinations for the position of stenographer one special competitive examination for superintendent of construction, three special competitive examinations for the position of oil inspector, and five special competitive examinations for the posi

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tion of deputy game warden. By means of these examinations 52 eligible lists have been prepared from which 125 appointments to permanent positions have been made on probation, and 23 temporary appointments have been made from the eligible lists.

A complete tabulated statement showing the number of examinations held, number of applications received, number who passed and number who failed, appears elsewhere in this report. See Part —.

The following financial statement shows what this work has cost the state:

STATEMENT OF EXPENDITURE CHARGEABLE TO THE APPROPRIATION
OF \$10,000 FOR THE FISCAL YEAR ENDING JUNE 30TH, 1906.

S. E. Sparling, Commissioner, salary and expenses.	\$553 86
T. J. Cunningham, Commissioner, salary and expenses	1373 97
Otto Gaffron, Commissioner, salary and expenses..	1189 82
F. E. Doty, Secretary and Chief Examiner, salary and expenses	2404 03
J. M. Sexton, Chief Clerk, salary and expenses	1063 78
Margaret Smethurst, Clerk, salary	66 00
Anna Lorigan, Clerk, salary	170 50
Caroline B. Greig, stenographer, salary	555 00
Katherine Houghton, stenographer, salary	9 00
Agnes Esser, stenographer, salary	30 50
Ruby Peek, stenographer, salary	61 33
Jessie Upfield, stenographer, salary	5 00
Olga Olson, stenographer, salary	124 00
C. H. Dietz, Reader, salary	40 00
H. S. Knight, Reader, salary	156 75
Mrs. R. L. Preston, Reader, salary	222 83
A. H. Lambeck, Reader, salary	24 25
Emil Olbrich, Reader, salary	15 00
Mary McGovern, Reader, salary	12 00
Geo. Bunsä, Reader, salary	83 75

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F. L. Fawcett, Reader, salary.....	206 25
W. H. Shepard, Reader, salary.....	7 50
E. B. Smith, Reader, salary.....	9 00
Local Examiners, Expenses.....	89 73
Callahan & Co., Book.....	5 00
Good Government, Subscription.....	1 00
Free Press, Advertising.....	7 00
Hicks Printing Co., Advertising.....	5 30
Superior Telegram, Advertising.....	2 40
The Chronicle Company, Advertising.....	7 35
Total expenditure	\$8,501 90

RECOMMENDATIONS.

In the administration of the law perplexing questions must frequently arise, but the one that presses for immediate solution is that of so adjusting the examining machinery as to secure with efficiency and promptness the best available candidates for the service of the state when such service is needed. A brief discussion of this subject follows under the headings; advertising and examinations.

Advertising. It is evident that the more widely information concerning vacancies is advertised the larger will be the number of desirable candidates. Examinations have thus far been advertised by means of posters mailed to post offices, libraries, local examiners and town clerks. Notices have also been mailed to newspapers with the request that such notices be given publicity as news items. A large number of the newspapers have complied with this request and have published these notices gratis. It appears from the correspondence that the latter method of advertising has accomplished far more than has the issuance of posters in bringing forthcoming examinations to the notice of interested candidates. So long as the press of the state continues to extend this courtesy there will be little difficulty in securing at a reasonable expenditure a sufficient number of candidates for the better paying positions; but without the support

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of the newspapers in this work the office would doubtless be seriously embarrassed.

Examinations. In the preparation of examination questions, when the work was of such a nature as to make it necessary to go outside of this office for assistance, little difficulty was found in getting aid from competent persons in the service of the state. However, if the examiner could at times employ the services of experts, not in the service of the state and if a small fund could be set aside to provide for such emergencies it would be desirable.

Local Boards. In the actual work of conducting examinations, there are at present 111 local boards, one for each assembly district and one for each district where the district comprises more than one county. These boards make the necessary preliminary local arrangements for forthcoming examinations, receive questions and supplies from the Commission, remain on duty during the day of the examination as long as it lasts, collect papers written by the candidates and return them to the Commission. For this work no compensation is provided. Their tenure of office depends upon their good nature. Should these local boards become weary of the work and ask to be relieved from further duty, it is not unreasonable to prophesy that the time may come when this work must fall into the hands of incompetent men, or men of an inferior standing in the community. In any event, it is not a pleasant task to ask favors of this kind, in behalf of the state, from citizens of the state who can ill afford to spare the time required; yet the present arrangement compels it. Provided the number of examination centers is not too large, an appropriation of \$1500 per annum, set aside for the compensation of local examiners, would prevent this embarrassment and would insure prompt and efficient service and longer tenure.

There are doubtless objections to reducing the number of examination centers. The present arrangement brings the examination closer to candidates and opens it to a larger number of persons. But it consumes a day's time of from one to three men in each assembly district for each examination. If local exam-

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iners were paid a reasonable per diem for services actually rendered, and if the number of local examiners were not so large as to make it a somewhat doubtful policy to do so, it might be feasible to place a larger burden of responsibility upon them. In selecting candidates for certain positions where oral tests and tests for physical skill and endurance should be applied, the candidate must come into personal contact with the examiner. In the examination for game wardens, for instance, it should be shown that a candidate can swim, row a boat, handle fire arms effectively, and that he possesses a personality that will make him an efficient officer. In the examination of guards for the state prison there should be tests of strength agility and marksmanship. Candidates for positions in mechanical trades should demonstrate ability through work actually performed. An examiner should take such steps in an examination as any officer or business man might deem it necessary to take in order to ascertain the merit and fitness of candidates, but with so large a number of examination centers, and with unpaid examiners it is next to impossible to conduct such examinations in the manner above indicated.

Notwithstanding the fact that the success of an examination depends upon the care and thoroughness with which it is prepared and carried through, the law limits this office to an expenditure of \$2000 per annum for clerk hire and services of readers and examiners. This amount is not sufficient to insure the best results. An analysis of the accompanying financial statement shows that while, during the first year the inclusive appropriation of \$10,000 was not exhausted, the sum of \$2,000, specified for clerk hire and examiners, was all expended. This restriction is unfortunate and unnecessary and should be removed.

TITLE OF POSITION VS. DUTIES.

Special Cases. In the non-competitive examination of original employes it was found that the statutory designation of certain positions in the service does not coincide with the service

performed. In such cases, it was difficult in the examination to conform to the letter of the law which provides that "no person shall be appointed or employed under any title not appropriate to the duties performed." Where it was found that compliance with the letter of the law would work an injustice and interfere with the needs of the service, by interrupting the successful administration of a department, the non-competitive examination was made to conform to the duties which custom has established. Exceptional instances of this sort are herein enumerated, with the suggestion that legislative action be taken, in such manner as may best satisfy the needs of the service, to make the title of all statutory positions inclusive of the duties to be performed.

Office of the Attorney General. The increase in the business of the office of the Attorney General has made it necessary for that office to provide for additional stenographic services since the various positions in that office were created. As a consequence of this condition the position of messenger, compensation \$720 per annum, is filled by a competent stenographer, and the duties of messenger are performed, either by the clerk or by the janitor.

Office of the State Treasurer. In the office of the State Treasurer, the actual service rendered by the mailing clerk, salary \$1200 per annum, occupies less than half of the time of a competent employe. The title of mailing clerk should be so extended as to make it possible to assign additional duties of a clerical nature.

Office of the Secretary of State. In the office of the Secretary of State an inquiry into the nature of the service to be performed, the duties and responsibilities and quantity of work assigned to the various employes, would doubtless show that a readjustment of salaries and titles should be made.

Office of State Superintendent. In recent years it appears that the State Superintendent has found it necessary to assign to the position of mailing clerk, salary \$1000 per annum, the duties of a stenographer. The incumbent is certified to the secretary of state for the complete amount of compensation assigned by law but under special private agreement with the su-

perintendent, has from time to time returned to the State Superintendent all money received from the state in excess of \$60.00 per month, and the money thus refunded has been used to employ an additional clerk whose name does not appear upon the pay roll and whose selection is therefore not made subject to the Civil Service rules. The title of this position should be changed; and, if the salary is larger than is necessary, it should be reduced to the actual amount retained by the incumbent. It is probable that, with the increased responsibilities and multifarious duties of the office of state superintendent in recent years, additional clerical force is needed and that it should be provided for in such a way as to make the above arrangement unnecessary.

The janitor employed in the above named office and appointed by the superintendent of public property under the provisions of section 418, laws of 1901, is also performing the duties of messenger and mailing clerk. If additional duties of a clerical nature were not assigned to the janitor additional janitorial service in other departments could be assigned to him.

The designation of the position of index and filing clerk in the same office, created by section 170 of the Revised Statutes, compensation \$1000 per annum, is not inclusive of the services now actually performed by the incumbent who is an expert stenographer and combines with the duties of index and filing clerk, those of stenographer and typewriter.

Office of the Dairy and Food Commission. During the past few years there has been in the Dairy and Food Commission a large expansion in the number of inspectors for field work, resulting in the addition of a great volume of clerical work, for which no increased provision has been made.

The assistants to the Commissioner are experts in dairy work and their services are required in the field and are too valuable there to be spared for office work. The provision for one employe in this office, as stenographer and clerk, seems disproportionately small and inadequate for the vast amount of work to be done in that office.

Office of the Railroad Commission. In the office of the railroad commission the position of clerk, created by section 362, laws of 1905, carries with it a compensation of \$1000 per annum.

The incumbent of this position renders a double service and is employed jointly by the superintendent of public property and by the railroad commission. As an employe of the superintendent of public property, his name appears on the pay roll as a laborer performing janitorial service and he is paid in this capacity the full amount paid to janitors, namely, \$55.00 per month. As an employee of the railroad commission his name appears on the pay roll as a clerk and he is paid for this service the additional sum of \$35.00 per month. The total amount received by this employee for service rendered in the office of the Railroad Commission comes therefore, to more than \$1000, the amount set aside by law for the position of clerk in the office of railroad commission.

Department of Public Lands. Decrease, in recent years, in the business of the department of public lands appears to indicate that the number of clerks at present employed in this department could be decreased without detriment to the service.

Department of the State Treasury Agent. Under the provisions of chapter 490, laws of 1905, the state treasury agent is empowered to appoint deputy treasury agents and to give them a commission for doing business. He collects under the law the entire commission of twenty-five per cent of all moneys received from licenses, from the state treasurer, and personally reimburses his deputies, but renders at the end of the year an account of all moneys expended and after retaining the stipulated salary returns any funds left in his hands to the treasury of the state. This provision of law makes it impossible for the state civil service commission to certify the pay rolls or bills of deputy treasury agents, notwithstanding the fact that these positions fall within the classified service of the state. If the law provided that all deputy treasury agents should be compensated for their services by warrants drawn by the secretary of state then the names of all such persons employed would come before the civil service commission for certification and the special rules applicable to treasury agents could be applied with certainty.

Department of Superintendent of Public Property. In the department of the superintendent of public property the care

of the engine room and boilers is left to three engineers and three firemen. One of the three engineers is the head engineer whose general supervisory duties appear to prevent him from assuming his regular shift. This necessitates an assignment of the duties of engineer to the electrician or to the plumber. A vacancy occurred during the year in the position of plumber, and the superintendent of public property requested the transfer and promotion of a fireman who has been shown to be a competent engineer. This request was accompanied with a statement on the part of the superintendent of public property that there is not sufficient work to employ a plumber regularly about the capitol, and that the person appointed to this position should be a competent engineer to be assigned to the duties of engineer. Upon this representation the request was granted.

It appears from the above showing that some legislative action should be taken, either to increase the force in the engine room or to change the titles of some of the positions so as to make them conform to the duties assigned to the incumbents.

In the department of the superintendent of public property the sum of \$2876.79 was expended during the fiscal year ending July, 1906, for clerical services rendered in the department of the bureau of labor and statistics. This arrangement has continued for some time, and indicates that an insufficient number of clerks has been provided by law for this bureau. Under the present arrangement, the appointing officer for important positions in the bureau of labor and statistics is the superintendent of public property, while the service to be rendered is under the direction and supervision of the commissioner of statistics.

These instances are sufficient to warrant the following conclusions:

1. In certain specific cases it is at present impracticable, without seriously interfering with the needs of the service, to enforce that section of the civil service law which provides that "no person shall be appointed or employed under any title not appropriate to the duties performed."

2. In certain departments additional service appears to be needed.

3. Salaries are not in all cases properly adjusted to the character of the service to be performed. In some cases they are too high, in others too low.

4. The special fund created by Chapter 419. L. 1901, creating an emergency fund of \$6000 for employment of extra labor in cases of emergency is at present over-drawn in order to supply these defects.

5. The law creating the department of state treasury agent differs from all other laws in that disbursements to compensate deputies are made by the head of the office rather than by the secretary of state, and this provision of law prevents certification of pay rolls of such deputy agents and renders the application of the civil service law to these positions, difficult.

6. A more specific assignment of duties to employes in the department of the Superintendent of Public Property, a reorganization and centralization of the work of that department would result in economy and better service.

LOW SALARIES.

The special provisions in the Civil Service Law applicable to state institutions have been fortunate at a time when the pressure of new work would have made it difficult to procure the necessary number of suitable eligible lists as needed. Up to the time of writing this report we have not procured eligible lists for positions as teachers in these institutions, and non-competitive examinations have not been required in cases of appointment where there was no eligible list. Beginning with the first of January, 1907, all appointments to positions in the non-competitive class and to positions in cases where there is no eligible list, will be made subject to non-competitive examination. These will be held as a rule under the supervision of officers of state institutions.

It has thus far been impossible to procure a sufficient number of applicants for the position of attendant. Three eligible lists for this position have been prepared since January, 1906. We started out by requiring a competitive written examination, but changed the requirements and based selection solely on the

application and preliminary paper, but even then, the low salary and the nature of the service to be performed, made these positions so unattractive as to cause frequent, almost daily changes. During this brief period a large number of persons whose names do not appear on our eligible list have been appointed as attendants. A month ago the State Board of Control took action to increase the beginning salaries of male attendants from \$21 a month to \$25, and of women attendants from \$16 to \$20. This action of the board has not operated long enough to enable us to determine what effect it may have upon the length of tenure of office. In this connection Superintendent W. A. Gordon of the Northern Hospital writes as follows:

“If your Commission agitated the proposition that the man or woman who has served in a state hospital for twenty years, should be entitled to a small pension for life, or if they served twenty-five years, they should have a still larger pension, you would be doing a great work, and would do much toward getting a more desirable class of people here and there would be an incentive for them to stay. A person who is willing to spend twenty years among the insane ought to have a competency instead of a bare subsistence.”

Whether or not Dr. Gordon's prescription is the right one, it is safe to assert that, either the service should be made more attractive, or that sufficient financial inducements should be offered competent employes to continue in it.

It has also been found difficult to procure a sufficient number of applicants for positions as firemen and engineers in these institutions and for certain positions in the labor class. This difficulty is traceable to the low salaries offered. Whenever a reasonable salary is offered no difficulty has been found in securing a sufficient number of desirable candidates.

CITIZENSHIP.

Section 10 of the Civil Service Law provides that “competitive examinations shall be free and open to all applicants who are citizens of the United States and of the State of Wisconsin.” In an opinion rendered by the Attorney General this clause ex-

cludes all persons not citizens of the State from competitive examinations. Occasions have arisen during the year when this restriction has seemed to interfere with the best needs of the service. In New York the Civil Service Commission is not prevented by law from making the following rule:

"Every applicant for examination must be a citizen of the United States, and an actual resident of the State of New York at the time of his application, provided, that such requirements as to citizenship and residence may be specially suspended by the commission as to any position requiring high professional, scientific or technical qualifications, or in cases where through low compensation for services such requirements are disadvantageous to the public interests, but all such cases, whether of individuals or groups with the reasons therefor, shall be reported to the legislature."

Experience justifies the belief that similar discretionary power should be granted by the legislature to the Wisconsin Commission.

THE OUTLOOK.

In conclusion, it is hoped that this report is sufficiently complete to make it possible to form a fairly accurate judgment as to the future of this work.

The non-competitive examination required by law of original employes proved of value in that it made the examiners familiar with the scope of the work actually performed by present employes and established a definite and practical standard for future examinations.

The preparation of fifty-three eligible lists within a period of ten months was an experience that must prove of great value in the future. It was accomplished under the most unfavorable conditions when the office force was new and when all work was in an experimental stage. Nevertheless, ninety per cent of the persons thus far appointed from eligible lists are found to have given satisfaction.

A sufficient number of examinations for higher positions has been held to demonstrate the practicability of filling such posi-

tions by competitive examinations. On the other hand, it can be shown from the records in this office that under a system of political appointment the percentage of incompetent and inefficient appointees is far larger in the higher positions where salary inducements invite political and personal pressure than in the lower positions.

If a spirit of absolute impartiality characterize the future administration of the law, and if constant effort is made to direct the various activities of the office in a way to insure simplicity, adaptability, effectiveness and promptness, there is no doubt that a real and lasting service may be rendered the state through the agency of this department.

Respectfully submitted,

F. E. Dory,
Secretary and Chief Examiner.



PART II.

Public Hearings on Classification.

Actions of the Commission.

Amendments to the Civil Service Rules.


PUBLIC HEARINGS ON CLASSIFICATION.

REQUESTS OF PUBLIC OFFICERS FOR AMENDMENT OF THE STATE CIVIL SERVICE RULES PLACING CERTAIN DESIGNATED POSITIONS IN THE EXEMPT AND NONCOMPETITIVE CLASSES:

Feb. 15, 1906.

Judge N. S. Gilson of the State Tax Commission presented arguments in behalf of said commission favoring the exemption of special assessors and special members of Boards of Review under Chapter 259, Laws of 1905, and all persons appointed to act as assistants or special assistants for the review and redetermination of the property in a county on appeal from the action of the county board under Chapter 474, Laws of 1905. It being shown that the service in the above named positions is usually of a temporary character rendered in localities where appointees reside and it being further shown that the locality where such service is to be rendered cannot be determined beforehand; that when appeals for redetermination of the value of property in a county are made, action cannot be long delayed; it was deemed inexpedient at this time to attempt to make up eligible lists by examination and the request was therefore granted for a period of not to exceed one year from the date of the adoption of this rule.

Pres. Chas. R. VanHise made request for the exemption of the registrar of the University, one position. It having been made to appear that the position of registrar in the University is one of an extremely confidential nature and that the peculiar duties of this position make it necessary, in filling the position, to make selection from other colleges and universities outside of the state, it was deemed inexpedient at this time to attempt to make selection from residents of the State by competitive examination. The request was therefore granted.



Pres. VanHise also made request for the exemption of the position of university architect from competitive examination. In the opinion of the Commission sufficient evidence had not been presented to show that it is impracticable to select a university architect by competitive examination from candidates residing in Wisconsin. The request was therefore denied.

Hon. C. P. Cary, State Superintendent of Schools, asked that the members of the State Board of Examiners for state teachers' certificates, three positions, be placed in the exempt class. The members of the State Board of Examiners are appointed by the State Superintendent and receive a per diem of \$5.00 and expenses. On account of the intermittent character of the work and because of the peculiar qualifications requisite for these positions the request was granted.

Dr. E. A. Birge of the State University made request on behalf of the members of the State Geological and Natural History Survey for the exemption of members of the scientific staff of said survey from competitive examination. It having been represented that persons of high and recognized attainments must frequently be selected whose residence is outside of the state of Wisconsin; it furthermore having been shown that the United States Civil Service Commission exempts these positions and that for that reason it is difficult to procure satisfactory candidates for these positions, the request was granted.

Mar. 22, 1906.

Hon. J. Q. Emery, State Dairy and Food Commissioner, appeared before the Commission to present arguments in favor of the exemption of special counsel under the provisions of Section 1410-a, Statutes of 1898, as amended by Chapter 193, Laws of 1905. The duties of this special counsel were represented as temporary in character. The conditions surrounding this service make prompt action in securing such services necessary. Selection of special counsel depends upon the locality in which the offenses are committed and the nature of the case to be prosecuted. For these reasons the request of the commissioner was granted.

The State Dairy and Food Commissioner also requested that traveling cheese instructors and creamery instructors employed by the Wisconsin Dairymen's Association as his expert agents shall be placed in the exempt class. It being understood that no cost is incurred by the Dairy and Food Commissioner for compensation and traveling expenses of such experts while thus employed, the request was granted.

The State Board of Control represented by Mr. Allen T. Conover requested that the position of chaplain in the state institutions be placed in the exempt class. The request was granted on the ground that it is not deemed feasible or wise to attempt to select a chaplain for the State Prison or other state institutions by competitive examination and that it would be difficult in such an examination and next to impossible to avoid all reference to the "religious affiliations" of the various candidates. The request was therefore granted.

Hon. C. P. Cary made request that the position of State high school inspector, rural school inspector, graded school inspector and inspector for the deaf be placed in the exempt class. On the ground that at this time action exempting these positions is not urgent and that it has not been fully demonstrated by actual experience that these positions cannot be filled satisfactorily by competitive examination, the Commission decided not to grant the request.

May 24, 1906.

The State Board of Assessment asked permission to appoint Prof. W. D. Pence of the University as expert engineer for the Board of Assessment without competitive examination. The Commission having been convinced that the position of expert engineer for the Board of Assessment is one requiring the services of a person of peculiar and exceptional qualifications of a professional character, the request was granted in accordance with the provisions of Section 17, Paragraph 2 of the law.

The State Railroad Commission made request that expert railroad accountants acting under appointment of the Railroad Commission be placed in the exempt class. The Commission also made request for the exemption of railroad statis-

ticians when employed temporarily as consulting railroad experts. The request was denied, but action was taken to place all consulting railroad expert statisticians rendering occasional services to the Commission in the non-competitive class on the ground that selection of such experts must frequently be made outside of the State and that therefore competitive examination is impracticable.

The State Board of Control presented arguments in support of its request that assistant superintendents in hospitals for the insane and feeble minded and the assistant warden in the State Prison be placed in the exempt class. At the conclusion of the hearing (postponed from March 22nd) action on this request was postponed indefinitely.

The question of examination of Deputy Treasury Agents having been brought forward by the secretary, action was taken to place all positions as deputy treasury agents in the non-competitive class where the compensation as shown by the records of the previous year is less than \$300.00 per annum.

July 19, 1906.

Upon the joint request of the President of the State University and the Secretary of the Free Library Commission, action was taken to place the position of Organizer of University Extension work in the non-competitive class for a period not to exceed one year from date. Request was also made that the position of Library Clerk for University Extension be placed in the non-competitive class for a period of not to exceed one year from date. The request was granted, it having been shown that it is necessary in the installment of this new work to make selection of some person having had previous experience in this kind of work outside of the state of Wisconsin.

Sept. 12, 1906.

Request was made by the presidents of the normal schools and State University that permission be granted to appoint bona fide students for temporary, occasional or intermittent service in their respective institutions. Arguments were presented by President Albert Salisbury of the Whitewater Normal school, Mr. William Kittle, secretary of Board of Regents

of Normal schools, Secretary E. F. Riley, Dean Turneaure and Professor Harper of the University in favor of such exemption. It having been shown that students can be and are actually employed in their various institutions in a great variety of useful ways, and the Commission being convinced that it is impracticable to establish eligible lists for so large a number of petty services where a diversity of talent is required, action was taken to exempt such students when employed in normal schools at a compensation of not to exceed \$15.00 in any one month and when employed in the University at a compensation of not to exceed \$25.00 in any one month.

ACTIONS OF THE COMMISSION.

STATE OF WISCONSIN, BEFORE THE CIVIL SERVICE COMMISSION.

In the Matter of the petition of George
E. Fess, alleged Deputy Oil In-
spector for a hearing and ruling } DECISION.

This matter was brought before the Commission by George E. Fess, of Madison, Wis., who alleges that he was removed by the State Supervisor of Illuminating Oils from the office of Deputy Oil Inspector, on the 14th day of December, 1905.

The petitioner alleges that Chapter 363 of the Laws of 1905, was enacted by the legislature on June 14, 1905, and that it went into full operation, according to its provisions, six months thereafter or at some time during the 14th day of December, 1905.

The petitioner prays that this commission may investigate and inquire as to the hour of that day when he was removed from office and when his successor was appointed so as to determine whether or not the removal and appointment were made within six months after the passage of the law.

The petitioner makes six contentions:

1. That the appointment of Winter (the successor of the petitioner as deputy oil inspector) violates the provisions of Section 2, of the Civil Service Law in that it was made for purely political reasons and without reference to merit and fitness.

2. That the appointment of Winter was contrary to law in that his name was not upon a list of eligibles certified to the appointing officer.

3. That the removal of the petitioner was contrary to law

in that it was done without notice being given to him or reason for such removal being filed.

4. That the appointment of Winter was void because it violated that provision of the law which prescribes that "no person shall be appointed to any position in the classified service for which rules have been prescribed until he has passed an examination."

5. That the removal of the petitioner and the appointment of his successor were void because contrary to the provisions of law that no discrimination shall be exercised, threatened or promised by any person in the Civil Service against or in favor of any applicant eligible or employe in the classified service because of his political or religious opinions or affiliations.

6. That the removal and appointment were void because made after the expiration of six months from the passage of the civil service law and were not made according to its provisions.

A brief for petitioner was submitted by Morris, Riley & Dudgeon and a brief for Herman Winter by Ernest N. Warner.

The purpose of the legislature in enacting the civil service law was to provide for the appointment and promotion of public servants according to merit and fitness and to furnish the means for better determining the fitness and ability of applicants for appointment in the public service. The law provides for the appointment of a civil service commission and among other things for the employment by them of a secretary and chief examiner. It provides that "within six months after the passage of this act and the appointment of the civil service commissioners as herein provided, the commission shall put into effect rules for the classification of the offices, places and employments now or hereafter created in the classified service of this state." It also provides that "within the same time (six months) the commission shall also make rules and regulations providing for examinations for positions in the classified service of the state, appointments to, removals from, and promotion and reductions therein, and for such other matters as are necessary to carry out the purposes of this act." The law provides that these rules shall, before going into effect, be approved by the governor.

The whole chapter read together, plainly shows that the legislative intent was to give six months for the commission to

formulate rules, prepare classifications and make ready to put the merit system into operation. At the end of six months from the passage of the law, appointing officers are prohibited from appointing any person except in accordance with the provisions of Chapter 363 and the rules and regulations of the commission.

The civil service act was not published, and therefore did not become a law until June 16, 1905. Six months from that time was December 16, 1905. It is contended, however, by the petitioner that the words "six months after its passage" should be interpreted to mean six months after the act was signed by the governor. This question is ably discussed by the opposing attorneys in their briefs. We are convinced by reading all the provisions of the chapter together, that the legislature intended to give six months from the time the act became a law, for the commission to formulate its rules and make other preparation to put the merit system into operation. The petitioner was removed from his office and his successor appointed by the state supervisor of inspectors of illuminating oils on December 14, 1905. At that time the rules of this commission had not been approved by the governor. There had been no examinations by the commission and there was no eligible list from which to select appointees. On December 14, this commission could in no way assist the state oil inspector in choosing his deputies. The machinery provided by the civil service law had not yet been set in motion. When it became the duty of this commission to certify to the secretary of state the names of persons properly upon the pay roll of the state, it found the name of Herman Winter as deputy oil inspector for the City of Madison. He had been appointed in the same manner that all other appointments were made before the civil service act went into full effect and the merit system became operative. It is to be presumed that he was appointed because of his fitness and ability to perform the duties of the office, although at that time there was no prescribed system for determining the fitness of applicants for positions in the public service.

In the removal of Mr. Fess and the appointment of Mr. Winter no rule of this commission was violated, for there were no effective rules at that time. Having determined this, it will not be necessary to consider the other contentions of the

petitioner. They are outside of the jurisdiction of this commission.

The prayer of the petitioner is therefore denied and the petition dismissed.

Madison, Wis., Feb. 12, 1906.

S. E. SPARLING,
T. J. CUNNINGHAM,
OTTO GAFFRON,
State Civil Service Commission.

AMENDMENTS TO CIVIL SERVICE RULES.

AMENDMENTS TO CIVIL SERVICE RULES AND REGULATIONS.

Adopted September 12th, 1906, in Accordance With the Provisions of Section 14, Chapter 363, Laws of 1905.

The state Civil Service rules are hereby amended by the following addition:

RULE II. EXEMPT CLASS.

Section 3. Bona fide students employed in state normal schools for occasional, temporary or intermittent service at a compensation of not to exceed \$15.00 for any one month during the school year or of \$30.00 for any one month during vacation periods are hereby placed in the exempt class.

Section 4. Bona fide students employed in the University for a temporary, occasional or intermittent service at a compensation of not to exceed \$25 during any month while the University is in session or of \$40 during vacation time, are hereby placed in the exempt class. (Adopted Sept. 12, 1906.)

Approved September 20, 1906.

S. E. SPARLING,
T. J. CUNNINGHAM,
OTTO GAFFRON,

State Civil Service Commission.

JAMES O. DAVIDSON,
Governor.

In accordance with the provisions of Chapter 363, Laws of 1905, the State Civil Service rules are hereby amended by the following additions:

RULE IV. THE NON-COMPETITIVE CLASS.

Section 4. In accordance with the provisions of Section 20, the following positions are hereby placed in the non-competitive class:

In the office of the Railroad Commission:

All consulting railway expert statisticians rendering occasional service to the Commission.

In the Department of the State Treasury Agent:

All deputy treasury agents whose compensation, as shown by the record of the previous year, is less than \$300.

The foregoing amendment to the rules prepared and adopted by the Civil Service Commission is hereby transmitted to the Governor for his approval. May 24, 1906.

S. E. SPARLING,

T. J. CUNNINGHAM,

OTTO GAFFRON,

State Civil Service Commission.

The foregoing amendment to the rules prescribed by the State Civil Service Commission are hereby approved.

J. O. DAVIDSON,

Governor.

State of Wisconsin,

Executive Chamber.

May 25, 1906.

AMENDMENTS TO CIVIL SERVICE RULES AND REGULATIONS.

Adopted in Accordance With the Provisions of Chapter 363,
Laws of 1905.

The State Civil Service Rules are hereby amended as follows:

RULE XIII. REINSTATEMENTS.

All of Section I of Rule XIII is hereby repealed.

RULE IV. NON-COMPETITIVE CLASS.

Section 5. The position of State Organizer for University Extension is hereby placed in the non-competitive class until July 20, 1908, after which time the position shall be filled by competitive examination whenever a vacancy in the position shall occur.

Section 6. The position of Library Assistant for University Extension is placed in the non-competitive class until July 20, 1908, after which time the position shall be filled by competitive examination whenever a vacancy in the position shall occur.

The foregoing amendment to the rules prepared and adopted by the Civil Service Commission is hereby transmitted to the Governor for his approval.

Dated July 19, 1906.

S. E. SPARLING,
T. J. CUNNINGHAM,
OTTO GAFFRON,
State Civil Service Commission.

Approved:

J. O. DAVIDSON,
Governor.

AMENDMENT TO THE CIVIL SERVICE RULES AND REGULATIONS.

Amendment to the Civil Service Rules and Regulations adopted April 19th in accordance with the provisions of Chapter 363, Laws of 1905.

The Civil Service Rules are hereby amended by the following addition:

RULE IV. NON-COMPETITIVE CLASS.

Section 4. The position of assistant state forester is hereby placed in the non-competitive class until April 19, 1908, after which time the position shall be filled by competitive examination when a vacancy in the position shall occur.

The foregoing amendment to the rules prepared and adopted by the Civil Service Commission is hereby transmitted to the Governor for his approval.

S. E. SPARLING,
T. J. CUNNINGHAM,
OTTO GAFFRON,
State Civil Service Commission.

Dated April 19, 1906.

Approved:

JAMES O. DAVIDSON,
Governor.

AMENDMENT TO THE CIVIL SERVICE RULES AND REGULATIONS.

Adopted in Accordance With the Provisions of Chapter 363,
Laws of 1905.

The State Civil Service rules are hereby amended by the following additions:

RULE II. THE EXEMPT CLASS.

Section 3. In accordance with the provisions of Section 14, the following positions are hereby placed in the exempt class:
In the office of the State Board of Assessment:

All persons appointed to act as special assessors and special members of boards of review under Chapter 259, Laws of 1905, and all persons appointed to act as assistants or special assistants for the review and redetermination of the property in a county on appeal from the action of the county board under Chapter 474, Laws of 1905, for a period of not to exceed one year from the date of the adoption of this rule.

In the State University:

The registrar of the University, one position.

In the office of the State Superintendent of Public Instruction:

The members of the Board of Examiners for state teachers' certificates,—three positions.

In the State Geological and Natural History Survey:

All members of the scientific staff.

In the State, Penal and Charitable Institutions:

The chaplain.

In the Department of the State Dairy and Food Commission:

Special counsel as provided for in Section 1410-a, Statutes 1898, as amended by Chapter 193, Laws of 1905, and expert agents for the inspection of cheese factories and creameries, when no cost for compensation or traveling expenses shall

thereby be incurred by the dairy and food commissioner. Approved Mar. 23, 1906.

The foregoing amendment to the rules prepared and adopted by the Civil Service Commission is hereby transmitted to the Governor for his approval.

S. E. SPARLING,
T. J. CUNNINGHAM,
OTTO GAFFRON,

State Civil Service Commission.

Approved, March 23, 1906.

JAMES O. DAVIDSON,
Governor.

PART III.

Statistics of Examinations and Appointments.

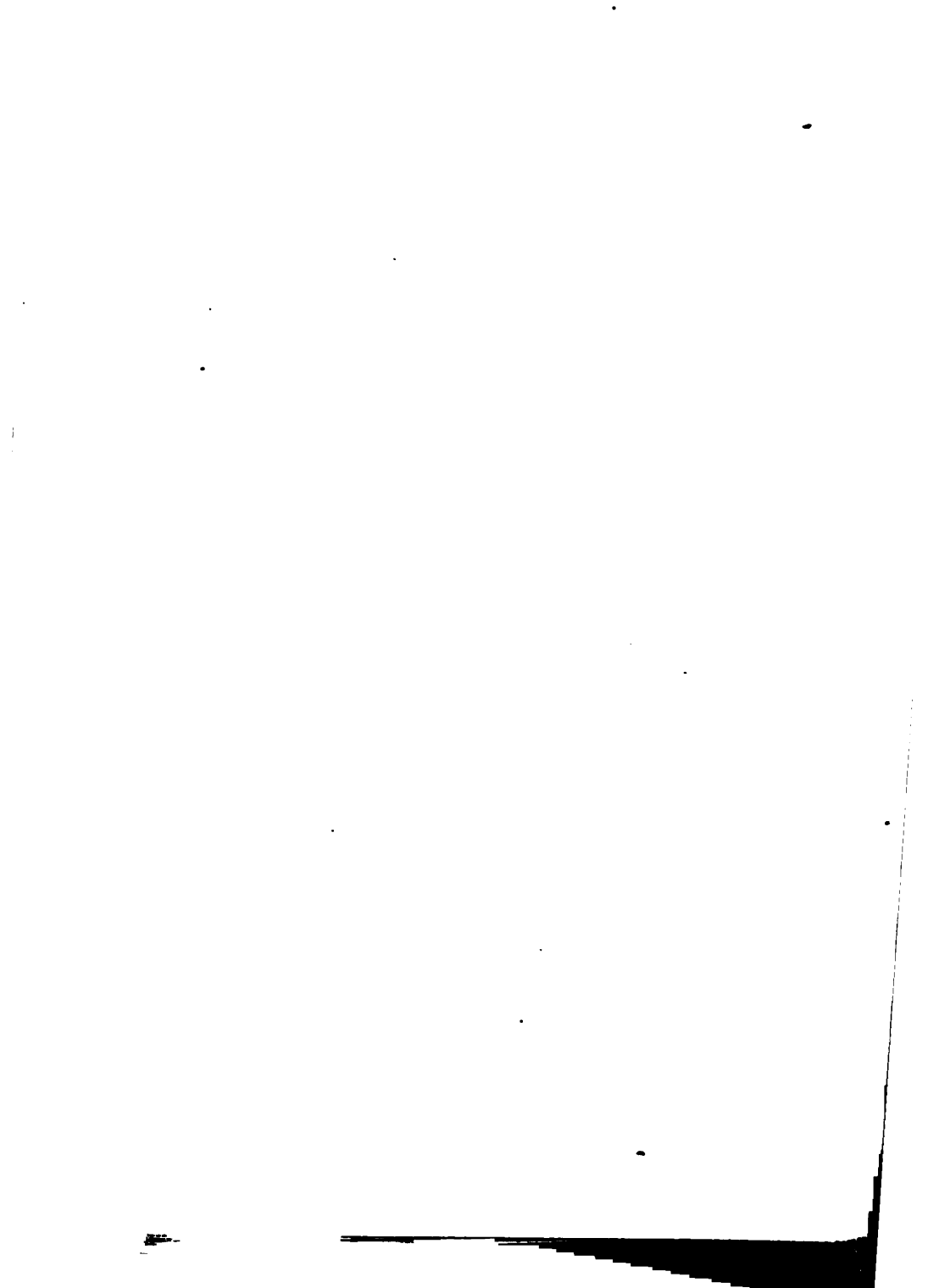
STATISTICS OF EXAMINATIONS AND APPOINTMENTS.

STATISTICS OF APPOINTMENTS FROM ALL ELIGIBLE LISTS SINCE JANU- ARY, 1908.

Class.	Permanent appoint- ments.	Temporary appoint- ments
Readers		11
Attendants	21	
Bookkeepers	1	
Firemen	5	
Engineers	8	
Clerks	5	8
Game warden	3	
Factory inspectors	1	
Guards	16	
Special agents	23	
Janitors	5	
Supt. of Buildings	1	
Oil inspectors	3	
Stenographers	11	4
Bakery inspectors	1	
Family officer and matron	4	
Messengers	1	
Electricians	3	
Painters	3	
Carpenters	4	
Supt. of construction	2	
Shoemaker	1	
Physician	1	
Total	121	23

TABLE SHOWING RESULTS OF NON-COMPETITIVE EXAMINATION OF ORIGINAL EMPLOYEES IN THE COMPETITIVE CLASS.

Class.	Permanent appointments.	Temporary appointments.
Class	No. Passed	No. Failed
A-1 Chief clerks	8	.....
A-2 Clerks	52	.....
A-3 Clerks-special	15	.....
A-4 Book-keepers	7	.....
A-5 Stenographers	26	.....
B Cashiers	1	.....
C-5 Game wardens	60	18
C-6 Watchmen	17	.....
C-7 Janitors	33	.....
D-1 Civil engineers	1	.....
D-3 Architects	1	.....
D-5 Engineers	13	2
D-6 Firemen	3	.....
F-1 Insurance examination	1	.....
F-2 Dep. factory inspector	11	2
F-3 Food inspectors	11	.....
F-4 Inspectors—educational department	6	.....
F-6 Oil inspectors and treasury agents	74	.....
G Law positions	2	.....
I-1 Actuaries and statisticians	4	.....
I-2 Expert accountants	3	.....
J Scientists	3	.....
M Mechanics and craftsmen	14	.....







PART IV.

Method of Procedure in Procuring Eligibles.

Specimen Questions Selected at Random from
Examinations Held During the Year 1906.



PART IV.

Method of Procedure in Procuring Eligibles.

Specimen Questions Selected at Random from
Examinations Held During the Year 1906.

METHOD OF PROCEDURE IN PROCURING ELIGIBLES.

Advertising. When information is received that a vacancy exists or is likely to occur, there being no eligible list from which to make selection to fill the vacancy, steps are immediately taken to advertise a competitive examination for the position in question. Appointing officers are consulted to ascertain the nature of the duties to be performed and the experience, education, training and personal and physical qualifications requisite for efficient service. With this information as a guide the plan of examination is outlined. Preliminary requirements as to age, previous experience, education, etc., are determined and steps are taken to advertise the examination.

Preparation of Examination Questions. During the interval that must then elapse before applications are received, steps are taken to prepare the necessary questions. If the examination is technical in its nature, experts in the service are consulted. Sometimes several experts submit questions. These are carefully tested in their relation to the duties and responsibilities of the position in question. All matter having no bearing upon the duties of the position is rejected. Academic questions are thrown out. Necessarily technical questions are discarded, and finally the core of the examination is reached. When the questions have been finally determined upon, no one but the chief examiner, as a rule, knows just what questions will be included in the examination. Suggestions have been received from various sources, and no one man other than the examiner has seen them all.

Notice to Applicants. Five days before the date set for examination, notices are issued to all applicants naming the date and place of examination.

Investigation of Applicants. At the same time letters are issued to persons named in the application of each candidate

making inquiry as to his character, habits, industry, skill and general efficiency, and fitness for the position in question. These letters go to former employers and in some cases, to persons named by him as references. So far as replies to these letters verify the statements of the candidate, they are given no weight in examination. In fact, letters from employers and others are made use of as a negative safeguard, rather than as a positive element in marking candidates.

The Examination. Three days before the date set for an examination, questions and supplies, together with full instructions for conducting the examination, are sent to each local supervising examiner. When a candidate appears for examination he is required, first of all, to fill out an identification sheet giving his name and post office address. To this he attaches a triangular slip containing a number concealed. The sheet is then enclosed in an envelope thereafter not to be opened until the reading and marking of all papers is concluded. When he writes his examination he attaches duplicates of the concealed number to his other papers. By this arrangement he and all other persons who might be interested in the matter, remain ignorant of his number.

At the close of the examination the papers are collected and returned under seal to the chief examiner. When all centers have been heard from, the seals are broken, the envelopes are opened and the papers are classified by position and subject. They are then given out to readers appointed by the Commission, or if of a technical nature, to experts regularly employed in the service of the state. In rare cases experts not in the service of the state are called upon for assistance. After the papers have been marked, the applications of the various candidates are read. All information contained in the application has some bearing upon the final standing of the candidate, his age, physical condition, previous experience, education—all receive consideration and are given definite values or "weights." The concealed examination numbers are then opened and compared with the concealed examination number attached to the identification sheet which up to this time has remained in the original sealed

envelope as it came from the examination room. The final mark on the application, which, for purposes of examination, is called the preliminary paper, is now brought together with the standings attained by the candidate in his written examination. The name, number, standing and various marks of the candidate are all brought together and the final average obtained. Those who pass the examination are notified of their standing and rank. Those who fail are also notified that they have not attained the minimum standing of seventy and that their names do not appear on the eligible list. Candidates who are found not to be citizens of the United States and of the state of Wisconsin, and all who, because of age, or physical or moral defects are not deemed as having satisfied the preliminary requirements, are notified that their applications are rejected. At the same time, the names of all persons who pass are registered in order of standing and their papers filed for future reference.

A PRACTICAL ILLUSTRATION.

In order to give a practical illustration of the method above outlined, copies of all forms and papers used in a recent examination held for the position of farm superintendent at the University are submitted. The following announcement was published for the information of candidates:

"Farm Superintendent. One position at the State University is now open at a salary of \$1200 per annum and house rent. This is an important position and the appointee, if successful, is likely to receive an increase of salary. The candidate should have a good common school education, and in addition to this, should have a specific agricultural training similar at least to that given in the short course in agriculture at the University. A college training is not essential. Preference will be given to candidates whose experience shows them to be practical, businesslike and capable in agricultural pursuits. The farm superintendent has charge of the lawn, shrubbery, road construction, farm cultivation and general care of the stock. The examination will include questions on the growing of crops, building of silos, general care and manage-

ment of live stock, drainage, building of roads, cement walks, etc.

Subjects of Examination	Relative Weights
Technical questions pertaining to the duties of the position	6
Preliminary paper showing education, experience, etc.	4

Investigations. When the applications of candidates had been received, the following inquiry was addressed to persons whose names appeared therein as vouchers or references.

“Dear Sir: The State Civil Service Commission is in receipt of the application of —— for the position of Farm Superintendent at the State university. This position carries a compensation of \$1,200 per annum and house rent. We have a large number of applicants for the position and deem it important that no mistake shall be made, but that the very best available man be selected.

Do you know the above named candidate? If so, would you recommend him as well qualified for this position?

Is the candidate a successful farmer? A successful business man? What experience has he had in handling men? Successful in handling men? Is he systematic? Orderly? Prompt? Businesslike? Is he familiar with modern, up-to-date methods of farming? What can you say of his personal habits? Reputation in the community? Give the names and post office addresses of two or three reliable persons who know the applicant.

Make no reference to the politics or religion of the candidate. Your answers to the above questions will be treated as confidential.”

Questions Used in Competitive Examination for Farm Superintendent.

Preliminary Paper.

What is your age?

Were you reared on a farm through boyhood?

How many years of your life since attaining your majority have you spent on a farm?

What is your present occupation?

What education have you received?

Answer the following questions relative to the farm on which you have been most actively employed: Were you owner or manager of this farm? How many years were you employed on or had charge of such farm? State size of farm in acres. State number of acres planted to corn, spring grains, in meadow, in pasture, the last year you were on this farm. State the number of animals on this farm: horses, cows, sheep, swine. How many men were employed on this farm? About what were the gross sales from this farm?

Did you or the owner keep a dairy or pournal of operations?

If so, give illustration of some of the daily entries, to show their range and character. State other facts of importance to show your practical farm experience. What agricultural journals, papers and books have you read and are now reading?

What has been your experience as a teacher or demonstrator of agriculture before agriculture students or farmers."

Practical Questions.

"Directions.—Do not sign your name but attach your concealed examination number to your paper.

1. Rule out a time book and place headings for keeping time of a number of workmen.
2. State the amount of grain in pounds (bran, oats, corn, or other concentrates), and also the amount of clover hay, silage, corn fodder, or other feed required to properly nourish a cow in full flow of milk for one day. On this basis, calculate the amount of feed that must

be provided for a herd of 30 cows during the six months of stable feeding.

3. Give the merits and faults of Indian corn as a food for swine.

How would you test the germination of seed corn?

5. What are the advantages of silage for dairy cows?
6. How can the manure of a dairy farm be handled to get the best results, economy of labor being a prime factor?
7. State the amount of feed, grain and hay separately, required by one horse one day, and from this calculate the amount required by twenty horses during the six winter months.
8. Describe the construction of a cement sidewalk; giving materials required, etc.
9. How should oats be treated to prevent smut?
10. State the legal weight, the average amount of seed required per acre, and the average yield of a good crop of the following:
 11. Describe a good sample of (a) old oats; (b) timothy hay.
 12. State the advantages and disadvantages of fall plowing stubble land to be sown to oats the following spring.
State the advantages and disadvantages of plowing clover sod for corn in spring just before planting time.
13. What symptoms would lead you to suspect presence of (a) colic? (b) fever in a horse?
14. How long in months or weeks, do the following animals carry their young: Horse. Cow. Sheep. Pig.
15. With pencil and sheet of paper show how you would arrange stakes, line or other device to guide in finishing the bottom of a ditch so that a tile drain laid therein would have a certain definite fall per rod.
16. State how you would regulate the watering of work horses? What precautions should be taken to prevent sore shoulders?

APPLICATION OF THE RULES OF MARKING TO ABOVE EXAMINATION.

Preliminary Paper.—The “preliminary paper” includes experience, character, habits and physical fitness. The relative

importance or "weight" given to these elements depends upon the nature of the position in question. In the examination for farm superintendent experience received a weight of 60, character and habits .25, and education .15. From the sum of these credits examiners were instructed to deduct 2 points for each year under 30, and 5 points for each year under 25, 1 point for each year under 55 and 5 points for each year over 60. A, who had received only a common school education, and whose age was 61, was given a mark of 7 points for education; appearing to have a good reputation in his community, he was given the full mark of 25 for character and habits. His experience having been confined to that of running a small 40 acre farm in a very ordinary way, his mark for that element was 40. Subtracting 10 points for age from the sum of credits received, his final standing on his preliminary paper was 62. In his written examination his mark on "practical questions" was 72. The published rule of weights provides that the standing on practical questions shall receive a weight of 6 and that the weight given to the preliminary paper shall be 4. Multiplying A's standing in "practical questions" (72) by the weight of 6, and multiplying the standing on the preliminary paper, which was 62, by 4, and adding the products, we obtain 680 which divided by the sum of the weights, or 10, gives us A's average standing of 68 per cent.

Procedure in Certification.—It frequently happens that many persons whose names appear on the eligible list are not willing to accept the positions offered because of the low salary. To certify the three names standing highest on the list without regard to their wishes in the matter, may cause serious delay if it turns out that none of them are willing to be considered for the place. In that event the work of the office in question is often seriously interrupted and several days, possibly weeks, may have elapsed before a series of certifications and negotiations long drawn out, have discovered the names of three persons willing to be considered for the place. To avoid this delay letters are addressed to all candidates on the eligible list asking them to name the conditions under which they will accept service, and more particularly to name the lowest salary they are willing to accept.

With this information, it is assumed that persons naming a higher salary than the one attaching to the place in question have in effect refused the position, and the three names standing highest on the list of those who have previously indicated their willingness to accept a salary as low as the one named are certified at once. This arrangement expedites the work of filling the position when vacancies occur, and seems to be in accord with the spirit and letter of the law.

SPECIMEN QUESTIONS SELECTED AT RANDOM FROM EXAMINATIONS HELD DURING THE YEAR 1906.

It is found impracticable to publish complete sets of questions for any position and no attempt is made to include all the positions for which examinations have been held.

EXAMINATION FOR LIBRARY CLERK.

Library Methods.

1. What are the essentials of good rebinding? What instructions would you give your binder?
 2. Classify twenty books selected from the list submitted using either the Dewey or Cutter system. See synopsis of classification on accompanying sheets. A reasonable modification of the classifications furnished is permissible.
 3. Make author cards for six books and indicate on back of card all subject headings you would use. (The examiner will furnish you with books and cards.
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EXAMINATION IN COMPUTATION FOR THE POSITION OF LIBRARY CLERK IN OFFICE OF STATE SUPERINTENDENT.

1. The following statistics are gathered from the reports of eight towns, known as A, B, C, D, E, F, G, and H, respectively:
No. of male children over 4 and under 20 years in the town: A, 348; B, 225; C, 478; D, 348; E, 184; F, 443; G, 246; H, 387.
-

No. of female children over 4 and under 20 years in the town: A, 297; B, 368; C, 289; D, 429; E, 399; F, 228; G, 197; H, 439.

No. of children between 7 and 14 in the town: A, 425; B, 368; C, 467; D, 491; E, 214; F, 309; G, 287; H, 438.

No. of male children enrolled in school in town: A, 116; B, 75; C, 154; D, 116; E, 74; F, 121; G, 88; H, 118.

No. female children enrolled in school in town: A, 187; B, 248; C, 200; D, 357; E, 288; F, 197; G, 160; H, 385.

No. of days school has been taught by qualified teacher during year in town: A, 160; B, 150; C, 180; D, 120; E, 140; F, 180; G, 170; H, 180.

Total No. days attendance during year in town: A, 29,150; B, 26,230; C, 38,940; D, 35,420; E, 21,825; F, 34,670; G, 18,925; H, 42,680.

- (a) Tabulate the above statistics.
- (b) Find total No. days attendance in all towns.
- (c) Find total average daily attendance in all towns.
- (d) Find total No. of children between ages of 4 and 20 in all towns.
- (e) Find per cent total enrollment is of total No. of children of school age.

EXAMINATION FOR CLERKS.

Arithmetic.

Directions:—In solving problems the entire process and computation must be given.

Do not write on this sheet but use paper furnished by the examiner.

Attach your concealed examination number to your paper.

1. The following statistics show the number of persons employed in several small factories, their occupation and rate of wages. Rearrange these statistics in the form of

tables and show thereby the number of persons in each occupation, the average wages paid in each occupation and the total average wages for all.

No. of persons employed.	Occupation.	Daily rate of wages.
7.....	Cutters	\$2 60
3.....	Helpers	83
4.....	Machine operators	2 67
6.....	Cutters	2 45
7.....	Helpers	1 15
2.....	Machine operators	1 75
3.....	Cutters	2 23
5.....	Helpers	1 35
11.....	Machine operators	1 65
2.....	Cutters	2 40
7.....	Helpers	83
4.....	Machine operators	1 90
12.....	Cutters	3 33
11.....	Helpers	1 00
1.....	Machine operators	2 33
5.....	Helpers	67
2.....	Cutters	2 20
5.....	Machine operators	1 35
10.....	Machine operators	85
13.....	Helpers	75
2.....	Cutters	3 00
3.....	Helpers	1 10
4.....	Machine operators	75

2. What is the interest on a bond of \$1,000 bearing $4\frac{1}{2}\%$ interest from April 15th to Sept. 19th?
3. How much will it cost to make an excavation 27 ft. long, 16 ft. wide and 10 ft deep at 47c a cu. yd.?

Examination in plain copy for clerks.

Not to exceed twenty minutes will be allowed for this exercise.

Be sure to attach your concealed examination number to your copy.

Accuracy and speed will have equal weight in determining rating. The examiner must accurately note on your copy the time of commencing and finishing, and the time consumed on this exercise, and place his name on the sheet.

Copy the following on separate sheet:

SUMMARY OF DISTRIBUTION, ALL KINDS, 1003-1904.

	1903.	1904.
Brook trout fry	1,512,500	2,090,000
Rainbow trout fry	1,050,000	2,288,750
Lake trout fry	16,108,000	20,462,000
Wall-eyed pike fry	46,170,000	37,825,000
Black bass fry	318,000	432,000
Black bass fingerlings		117,900
Whitefish fry	37,500,000	20,376,000
Muskellunge fry	100,000	50,000
Pickerei, impregnated eggs	2,080,000	
Pickerei fingerlings		2,000
Miscellaneous distribution	200,000	102,200
Total distribution	105,098,625	83,737,850

I take pleasure in commending the employees of the Commission working under my direction for efficient and painstaking service. Too much credit for the work accomplished by this department cannot be given them. The majority of our employees have been in the service for several years, and practical experience, constant attention to duty and never failing interest are the qualifications which they bring to their task and which make their services valuable to the Commission.

Respectfully submitted,

EXAMINATION FOR CREAMERY INSPECTORS.

Technical Questions.

Directions:—Do not write on this sheet but use paper furnished by the examiner.

Attach concealed examination number to your written paper.

1. State necessary process and conditions for the accurate determination of the butter fat content of milk by the Babcock test.
2. Describe the Wisconsin curd test for determining the proper conditions of milk for butter making.
3. What are the essential characteristics of "extra" creamery butter and what are the requisites in the production of such butter?
4. What is your plan for conducting inspections of creameries for the purpose of determining their legal status?

5. Complaint is made that certain patrons of a creamery are furnishing unclean milk in unclean cans; you are sent as inspector to the factory, what are your legal duties?
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EXAMINATION FOR INSPECTORS OF BAKERIES.

1. What authority may a bakery inspector exercise over infectious diseases?
 2. Name some of the duties of the Bureau of Labor and Boards of Health in connection with bakeries. What authority may Common Councils exercise in enforcing the bakery laws of the state?
 3. How would you proceed against a person who is grossly violating the bakery law? What penalties may be imposed for its violation?
 4. What is meant by "well established sanitary principles?"
-

EXAMINATION FOR FOOD INSPECTORS.

Food Laws, Duties of the Position, Letters and Reports.

1. A sample of some food product that you purchased from some grocer or meat dealer is found upon analysis by the chemist to be adulterated; you are directed by the Commission to prosecute the dealer; state the proceedings you will take.
 2. What constitutes an "adulterated" article of food, within the meaning of the general law of Wisconsin?
-

EXAMINATION FOR THE POSITION OF BOOK-KEEPER.

1. What is the interest on a bond of \$1,000 bearing $4\frac{1}{2}\%$ interest from May 4th to September 19th?
2. Determine the interest on the following account March 31st at 5% per annum; interest to be paid on daily balances:

Deposited Jan. 1	\$40,000
Withdrew Jan. 20	1,000
Withdrew Feb. 2	2,500
Withdrew Feb. 22	4,000
Withdrew Mar. 1	1,000
Withdrew Mar. 25	500

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12 1-2 per can.
5.60 per bbl.
11 1-3 per gal.

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AND REFORM- RDS.

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13. Have you ever superintended men in any industry? If so, when and where?
 14. Have you ever received any military drill? In what capacity? When and how long?
 15. State any service you have had as policeman, prison officer, attendant at any institution requiring control of persons restrained of their liberty.
 16. Have you ever been called upon to defend yourself or another person with weapons?
 17. Have you good control of your temper and language when provoked to anger?
 18. Have you had any experience that would justify you in the belief that you are self-possessed in time of anger?
 19. What experience have you had in the use of firearms?
 20. Do you know anything about boxing and wrestling?
 21. Are you able to keep on your feet ten out twelve hours during the working day?
 22. Are you able to walk along a flat coping on the top of a wall 22 feet high without becoming dizzy or losing your balance?
 23. Do you know anything about criminals, their habits, etc.?
 24. Would you care to make the occupation of a guard in the state prison or reformatory your life work? If not, how long do you think you want to remain in the work?
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EXAMINATION QUESTIONS FOR SUPERVISORS' OF DAIRY TESTS.

1. What special difficulties are met with in operating hand testers, and how are they overcome?
- 2 (a) What is the appearance of the fat column in a good test?
(b) What defects are met with in the fat column in the case of unsatisfactory tests, and how are they avoided?
3. A cow gives 10.5 pounds of milk, testing 4.6% in the morning, and 9.3 pounds, testing 4.25% in the evening; what is her total production of milk and butter fat, and the average per cent of fat in her milk for the day?

EXAMINATION FOR THE POSITION OF ACTUARY.

GENERAL QUESTIONS.

1. If the net value (terminal reserve) of an insurance policy at end of 7 years is, according to a 3% mortality table, \$153.31 and the net annual premium for the policy \$27.19, what is the mean reserve for the policy for its 8th policy year, the cost of insurance for the same year being \$7.59 by the same table?
2. State the extent of your mathematical knowledge.
3. If "v" represents the present worth of \$1 due in one year, what would be the analogous representation for the present value of \$1 due in 7 years?
4. Find the true discount on that sum of which \$18.26 is the interest at $4\frac{1}{2}\%$ for one year and at the same rate?
5. What is the probability of failing to draw in a single drawing the white ball from a bag containing 4 black balls, 3 red balls and 1 white ball, also the probability of drawing either a black ball or a red ball?
6. A "C. & N. W." bond, par value \$50,000, $3\frac{1}{2}\%$ payable annually, sells in the open market for \$50,875 with 6 months' accrued interest, what is the effective rate of interest?
7. If A took out a policy in 1895 on ten payment life plan, what is the reserve at the expiration of ten years known as or denominated?

EXAMINATION FOR THE POSITION OF AUDITOR.

Auditing.

1. As bookkeeper in auditing office you keep a set of accounts which are supposed to duplicate those of the regular accounting department, but the regular accounting department makes all its charges from vouchers made up of all bills on hand of each creditor, while you make all charges directly from your duplicate bills. No accounts are kept with the creditors except the bills and vouchers. At the end of the month the total of the charges to the various departments as reported by the

accounting department does not agree with the total of similar charges as shown by the ledger of the auditing department. How would you proceed to locate the errors?

2. You are asked for assistance in a business where a certain amount of funds is allowed for various purposes and each of these purposes is given an account in the ledger. In order to expend these various funds it is necessary for persons concerned to first make a requisition for the purchases. When the bills come in they are charged to the accounts. How would you rule and print the ledger page so it would show the items that have been requisitioned against the account, the balance still subject to requisition, the items actually charged to the account and the balance yet unexpended?

Bookkeeping and Accounting, Journalizing.

1. Make simple journal entries on plain paper for the following transactions:

Purchased a bill of good amounting to \$86.43, paying cash.

Sold James Roe on account, 50 barrels of flour \$200.86;
16 barrels meal, \$71.46.

Richard Alton paid us cash for his note, \$78.64 with interest, \$17.24.

John Manning sold for cash, merchandise from our warehouse amounting to \$834.16 upon which we allowed him a commission of \$83.42. He turned proceeds over to us immediately.

Carl Williams settled his account of \$783.16 by giving us his note for \$100; Samuel Snyder's note for \$77.86 with accrued interest \$4.67; a draft on First National Bank drawn on Chase National Bank of New York for \$432.16; and the balance in currency.

2. Give two examples of the use of special columns and explain their value clearly.

OFFICE RULES GOVERNING CLERKS, READERS
AND EXAMINERS IN THE OFFICE OF THE
CIVIL SERVICE COMMISSION IN EXAMINA-
TIONS HELD PRIOR TO OCTOBER 1, 1906.

OFFICE RULES.

The following rules governing clerks, readers and examiners in the office of the Civil Service Commission are published as typical to give the general public an idea of how the work is conducted. No attempt is made here to cover the entire ground. These rules, are subject to modification from time to time without notice to the public.

GENERAL RULES FOR MARKING PRELIMINARY
PAPERS.

1. Do not register candidates who fail to present vouchers or who fail to make oath to the application, or whose applications are in other ways vitally defective. Mark such rejected, at least temporarily, and state reason.
 2. Unless otherwise provided in the advertised examination, reject all candidates under 21 years of age.
 3. The following elements should be considered in rejecting applicants:
 1. A criminal record or unquestioned evidence of dissipation.
 2. Unquestioned evidence of extreme physical disability.
 3. Reject all persons who are not citizens of the United States and of the State of Wisconsin.
 4. Make note of any other exceptional cases that may arise where it would seem that the applicant should be rejected and state the reason why.
 5. The marking should be based primarily upon the statements of the applicant himself. Where the statements of a former employer or a voucher do not agree with the statements of the applicant, and are not in his favor
- 6—C. S.

or, give weight to the letter. Where letters have not been received from former employers or vouchers, who have undoubtedly been addressed, further investigation must be made.

RULES GOVERNING MARKING OF PRELIMINARY PAPERS OF LIBRARY CLERKS.

- Education, 40
Graded as follows:
1. Normal school plus university.
2. University.
3. Normal.
4. Below.
- Experience, 60
Give credit for experience as librarian, teacher and clerk.
- Physical condition:
Mark off for physical defects interfering with efficiency.
- Age:
Five points off for each year under 25.
Two points off for each year over 45.
- Character and habits:
Mark off for proved defects.
-

RULES FOR MARKING PRELIMINARY PAPERS OF STEAM ENGINEERS.

1. Experience, 40
Experience required: two years' operating stationary engines or three years of practical experience as machinist, etc., one of which must be as operator of engine.
2. Age, 10
Reject below 21. 1% off for each year below 25.
1% off for each year over 45.
3. Physical conditions, 20
Poor physical condition is cause for rejection.
4. Character and habits, 20
5. Education, 10

RULES FOR MARKING FIREMEN.

Same as for engineers except as to required experience.

RULES FOR MARKING PRELIMINARY PAPER OF STENOGRAPHERS.

Experience,	60
Actual experience as stenographer:	
3 years of A No. 1 experience	60
2 years' experience	50
1 year's experience	40
No experience as stenographer	30
Education,	40
High school and business college (full course)....	40
Common school and business college	30
Self educated depends on record and ability shown.	

Age, 21 to 40.

 Five points off each year under 21,
 Two points off for each year over 40,
 Five points off for each year over 50.
 Below 18, rejected.

Physical condition,

 Mark off for any defect which would handicap applicant in discharge of duties.

Character and habits,

 Mark off for any apparent defect.

RULES FOR MARKING RAPID ADDITION.

Give a strict marking on the whole paper; then mark for accuracy, using the number of columns attempted as the basis, then average the two.

RULES FOR MARKING ARITHMETIC.

Where the method is correct, but the answer incorrect, mark from 5 to 9. If the answer is nearly correct approach the maximum. If the answer is correct and no method shown, mark 9. As a general rule give each question credit for all ability shown.

PENMANSHIP.

Grade papers from best to poorest.

PART V.

Opinions of the Attorney General Relating to the
Civil Service Law.

Court Decisions.

OPINIONS OF THE ATTORNEY GENERAL RELATING TO THE CIVIL SERVICE LAW.

Sept. 22, 1905.

HON. F. E. DOTY,

Secretary State Civil Commission,
Madison, Wis.

DEAR SIR:—I have your letter of the 19th inst. in which you request my opinion as to whether or not the legislative employes not specifically mentioned in Chapter 515, Laws of 1905, are subject to the rules of competitive examination by the Civil Service Commission.

It appears from Chapter 363 that all legislative employes are placed in the classified list. They are not in terms designated as exempt or non-competitive. Section 15, of that chapter provides that all positions in the unclassified service except such positions as are designated as exempt or non-competitive, shall be included in the competitive class. Taking this section by itself it would seem that all legislative employes should be placed in the competitive class. In this matter however, it seems that Chapter 363 conflicts with Chapter 515, Section 1 of Chapter 515, Laws of 1905, which provides that,

“Each clerk required to do typewriting shall furnish his own typewriter. Such clerk shall be chosen from the eligible list furnished by the civil service commissioners, in such manner as the rules of the senate and assembly may provide.”

In the interpretation of this section the question arises, do the words, “such clerks” refer to all the clerks mentioned in the section which comprise all the legislative employes or do they refer merely to the clerks required to do typewriting? If the plural instead of the singular number had been used the provision would naturally be interpreted to refer to all the clerks mentioned in the section, but the singular number is

used, and it follows the sentence, "each clerk required to do typewriting shall furnish his own typewriter." Therefore by the ordinary rules of construction the provision that clerks shall be chosen from the eligible list refers to what immediately precedes it, that is, to clerks required to do typewriting.

Chapter 515 was approved June 21st, seven days after the approval of Chapter 363. Therefore if there is a conflict between the provisions of these two chapters, the provisions of Chapter 515 would be presumed to have repealed the conflicting provisions of Chapter 363.

As the chapter specifies that certain clerks shall be chosen from the eligible list furnished by the civil service commissioners I am of the opinion that by implication it was intended by the legislature that other legislative employes should continue to be chosen in the manner that they were chosen prior to the passage of this act. It is a rule of interpretation that statutes should if possible be read together so as to give them effect. Reading all of the sections of the law relating to legislative employes together, I am of the opinion that the civil service commission has no jurisdiction over legislative employes generally, except to classify them. Legislative employes required to do typewriting are subject to examination and come within the rules established by the civil service commission.

Yours very truly,

L. M. STURDEVANT,
Attorney General.

Oct. 11, 1905.

HON. F. E. DOTY,

*Secretary State Civil Service Commission,
Madison, Wis.*

DEAR SIR:—Your letter of the 9th inst. has been received and has had careful consideration. You ask for my opinion as to the interpretation of the words "principal executive officer" and "appointing officer" as used in chapter 363, laws of 1905.

There are three and only three branches of government, to-wit: legislative, executive and judicial. All officers are executive officers who are charged with the duty of enforcing law. Administrative officers are such executive officers as are required to use discretion or judgment in performing their of-

official duty. For example, the office of Commissioner of Banking constitutes a division of the executive department of the state government. The commissioner is an executive, administrative and appointing officer. The same may be said of the Dairy and Food Commissioner, the Commissioner of Statistics and similar offices.

Section 14 of Chapter 363, laws of 1905, provides that "The following positions shall be included in the exempt class, 1. Deputy or assistant of each principal executive officer, and the chief clerk or secretary of any board or commission; 2. One, stenographer for each appointive officer, board or commission."

I am of the opinion that these provisions apply not only to elective administrative officers, but also to the head of each executive department, even though the head of that department obtains his office by appointment. The fact that a chief clerk or secretary of any board or commission is made exempt in the same section and directly in connection with the exemption of one deputy or assistant makes it quite clear this was the legislative intent.

It is my opinion that you are correct in your interpretation of the word "appointing officer" as used in this law. Appointing officers are those who are authorized by law to appoint their subordinates and does not apply to those who may be deputized by their superiors to appoint.

Yours truly,
L. M. STURDEVANT,
Attorney General.

October 25, 1905.

F. E. DOTY, *Secretary and Chief Examiner,*
State Civil Service Commission,
Madison, Wis.

DEAR SIR:—I am in receipt of yours of the 20th inst in which you request my opinion upon the following statement of facts:

The Commissioner of Insurance, under the provisions of section 1967-a, Wis. stats. 1898, is required to appoint a deputy commissioner of insurance, a chief clerk and actuary, examiner, filing clerk, stenographer, messenger and mailing clerk and two general clerks. The salaries of these appointees are fixed

by section 170 Wis. stats. 1898. Section 1967-a was amended by chapter 503, laws of 1905, so as to provide for the appointment of a deputy commissioner, a chief clerk and examiner, license clerk, filing clerk, two stenographers, messenger, and mailing clerk and one general clerk. This amendment is to take effect on and after the first Monday of January, 1907.

After the passage of this act, chapter 519, laws of 1905, was enacted, which provides that the Commissioner of Insurance shall appoint an actuary, at a salary not exceeding \$2,400 per year, who shall hold their respective offices until removed for cause. This act is to take effect on the first Monday of January, 1907, and all acts or parts of acts inconsistent or conflicting with the same are repealed.

The salary of the actuary now in office, under the provisions of the present statute, is fixed at the sum of \$1,200 per annum. The salary of the stenographer provided for at present is \$720 per year. Under the provisions of section 1967-a, no license clerk, by that name, is provided, and the new act does not fix the salary of the license clerk or the additional stenographer.

Under these conditions, you ask:

"1. May the license clerk under the new law be appointed to receive the salary of the general clerk, and may the stenographer be appointed and receive the salary of the actuary under the old law?"

As to the license clerk: by very liberal construction of the statute, it might be held that he is the same officer provided for as a general clerk, or that he takes the place of one of the general clerks now provided for by the provisions of Section 1967-a, and that the new act only makes a change in the name of the office.

You will note that the statute now provides for two general clerks and also a filing clerk. The filing clerk is retained under the new act, and therefore that officer is not changed by the act; so that it is probable that the license clerk is only the general clerk under a new title, and it may be held that he is entitled to the salary provided to be paid to the general clerk. I am of that opinion.

As to the additional stenographer, provided for by the amendment; no salary being fixed and no provision being made for a salary for the additional stenographer, it follows that

none can be paid under the provisions of the statutes as they now stand, or as they will stand after the first Monday of January, 1907. A stenographer cannot draw the salary of the actuary under the old law: that is evident; nor can she receive the salary of the general clerk, for a stenographer is not an actuary or a clerk under the wording of the act. The additional stenographer is a new office created without a salary attached to it. Can she receive the salary of \$720 fixed under Section 170 for a stenographer in the Commissioner's office?

Under the rules of construction set forth in subdivision 2 of section 4971 Wis. stats., 1898, every word importing the singular number only may extend and be applied to several persons or things as well as to one person or thing; so, if we interpret the word "stenographer" as used in section 170 according to this rule of construction, it might be held in the absence of other considerations, that she could draw the salary of the stenographer, viz., \$720. But we are met with the further consideration that only \$720 is appropriated to pay stenographers by the provisions of section 170; that is, a stenographer in the office of the Commissioner of Insurance. In other words, no appropriation is made by the legislature for the payment of any sum to stenographers in that office in excess of \$720.

My opinion therefore is that the additional stenographer is not provided with a salary under the provisions of the statutes as they now stand.

"2. Does the actuary serving in 1905 continue as actuary in January, 1907, under Chapter 519, Laws of 1905, without action of the Commission, provided, of course, that the actuary under the old law has passed the competitive or non-competitive examination, as the case may be. That is to say, is the position of actuary, carrying a salary of \$2,400 under the new law, a new position, requiring a new appointment under civil service rules? Would civil service rules governing promotion apply in this case? That is to say, would the continuance of the then present incumbent be deemed a new appointment to a new position, or might it be deemed a promotion?"

The question resolves itself into two propositions, the first of which is, whether Chapter 519, Laws of 1905, creates a new

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has expired, just as other subordinates will retain their positions. The law now and in January, 1907, will require the Secretary of State to make certain appointments, but it would not be argued from this fact that he shall make appointments when there is no vacancy, and thus disregard the statute. While he has the right and power to appoint, yet that right is so far modified by Chapter 363 as to only allow or require an appointment in case of a vacancy in a position. Chapter 519 provides that the Commissioner shall appoint an actuary, but so does the statute provide that the Attorney General shall appoint his assistants but he will not appoint them unless there is a vacancy. Section 1967-a provides for an actuary to be appointed by the Commissioner of Insurance. On the first Monday of January, 1907, this section will be no longer in force, as it will be repealed on that day by Chapter 519; but there is no interval between the two acts, and no time intervenes between the repeal of the one and the taking effect of the other, and there is no time when an actuary is not provided for by law. The office continues; there is no office to be created by a new method. The proceeding is the same. The Commissioner appoints, under both the old and the new statute, in exactly the same manner. The amendment is a continuation of the statute, and therefore a continuation of the office. The effect of a repeal of a statute and its re-enactment in the same words, by a statute which takes effect at the same time, with a repealing act, is to continue such statute in uninterrupted operation.

Laude v. C. & N. W. Ry. Co., 33 Wis., 640,
State v. Gumber, 37 Wis., 298.

My opinion therefore is that Chapter 519, Laws of 1905, does not create a new office, but is simply the continuation of an existing office, and that the civil service act applies to the appointment in the same manner as it applies to the appointment by the heads of all the other departments of the state.

The question yet remains whether the actuary in the Commissioner's office in January, 1907, on account of the rise in salary provided for by Chapter 519, will fall within the statute relating to promotions.

It is provided by Section 18, Chapter 363, Laws of 1905, that promotions shall be based upon merit and fitness, to be ascertained by examinations to be provided by the Commission, and it further provides that:

"For the purpose of this section, an increase in salary or other compensation of any person holding an office or position within the scope of the rules in force hereunder beyond the limit fixed for the grade in which such office or position is classified shall be deemed a promotion."

Within these provisions, I think it should be held that, when the actuary is to receive the additional salary of \$1,200 per year, he shall be subject to the rules prescribed by the Commission for examination, on the ground that it is a promotion within the meaning of the civil service act.

Yours truly,

L. M. STURDEVANT,
Attorney General.

October 31, 1905.

HON. F. E. DOTY,

Secretary of State Civil Service Commission,
Madison, Wis.

DEAR SIR:—Your letter of the 30th inst. has been received and contents carefully considered. You ask if it is within the power of the State Civil Service Commission to exempt from non-competitive examination after a public hearing, original incumbents of positions not especially named in the law as exempt.

Section 9 of Chapter 363, Laws of 1905, provides that:

"The commission shall require of all officers or employes at present in the civil service, falling within the provisions of this law, as well as of all persons appointed after the passage of this act and before the rule shall take effect, except officers or employes of the several state reformatory, charitable and penal institutions, a non-competitive examination as a condition of continuing in this service longer than six months after the adoption of the rules provided for in this section."

Section. 14 places certain positions in the exempt class and adds that:

"In addition to the above there may be included in the exempt class, all other officers or positions except laborers for the filling of which competitive or non-competitive ex-

aminations shall be found by the civil service commission to be impracticable on account of the temporary character of the employment or for special reasons satisfactory to the commission.

Section 9 requires a non-competitive examination of all employes at present in the civil service falling within the provisions of the law. Such positions the filling of which by examinations shall be found by the commission to be impracticable for special reasons satisfactory to the commission, do not come within the provisions of the law requiring examinations."

I am therefore of the opinion that the Civil Service Commission, may after a public hearing and for special reasons, place certain positions in the exempt class and exempt the original incumbents from examination.

Yours very truly,
L. M. STURDEVANT,
Attorney General.

Nov. 4, 1905.

HON. F. E. DOTY,
*Secretary & Chief Examiner,
Civil Service Commission.*

DEAR SIR:—In your letter of November 2nd you ask my opinion upon the following questions:

"1. Has the State Board of Control, under the authority granted to it in section 13, chapter 363, laws of 1905, power to classify positions as exempt?

"2. If so classified, is the Commission in any case required by law to adopt the classification?

"3. Assuming that the Commission should adopt such a classification, is such classification subject to the veto of the Governor? (You will note that the law provides that all exemptions shall be published in the rules (See Section 14), and that it further provides that the rules must be approved by the Governor.)

"4. Section 15 provides as follows: 'The competitive class shall include all positions for which it is practicable to determine the merit and fitness of applicants by competitive examination and shall include all positions and employments

now existing or hereafter created, of *whatever function, designation or compensation in each and every branch of the classified service*, etc. If an affirmative answer is given to question one, What bearing has the above provision upon the matter of classification in state institutions? What recourse is there, if the spirit of this requirement is violated in making such classification?"

Section 13 of chapter 363, laws of 1905, provides:

"The superintendents or heads of the several state reformatory, charitable and penal institutions shall, within thirty days, arrange all positions connected with their respective institutions, into classified lists, conforming as near as may be to the spirit and purpose of this act, and such classifications, when approved by the State Board of Control, shall be adopted by the commission as the classification in such respective institutions, and adequate eligible lists shall be made up and so far as possible at all times kept by the commission, from which appointments shall be made in such institutions."

It will be noticed that the classifications so made in said institutions "shall be adopted by the commission as the classifications in such respective institutions." If section 13 is to be understood as giving the superintendents, or heads of the several institutions the right to classify positions as exempt, then the Civil Service Commission would be compelled to place these positions in the exempt class; but section 14 specifically forbids the Commission's making exemptions, except after public hearing, and requires that these exemptions shall be published in the rules.

Thus section 13 would require the commission to place positions in the exempt class without a public hearing, while section 14 forbids the commission to place positions in the exempt class without a public hearing. This would be inconsistent.

It seems to me the right construction of section 13 is that the Legislature simply intended to give the superintendents of the state institutions, with the approval of the Board of Control, the right to make classified lists: that is, group the positions for the purposes of examination, to aid the commission in its work.

In my opinion this is the only construction that is consistent with the other provisions of chapter 363.

A negative answer to your first question makes it unnecessary to answer other questions.

Yours very truly,

L. M. STURDEVANT,
Attorney General.

November 13, 1905.

HON. F. E. DOTY,

Secretary of State Civil Service Com.,
Madison, Wis.

DEAR SIR:—Your communication of the 9th inst. has been received. You ask my opinion upon the following questions:

"Does the clause 'All presidents, deans, principals, professors, instructors, scientific staff or teachers in the University, normal or public schools, etc.' include teachers employed in the state institutions under the supervision of the state board of control?"

"Is the University a public school?"

"Has the term 'Public School' a technical or special meaning whenever employed in Wisconsin law or may it be interpreted to include the state university, normal schools and state institutions?"

The words, "public school" as they are generally used, may be defined as an educational institution supported by the public and which is free and open to all the people alike. The statutes of Wisconsin frequently contain the words "Public school system," which seems to include the common schools, the free high schools, the state normal schools and the state university. In this sense the normal schools and the university being supported by public funds and being open to all the people of the state are public schools. However the statutes of Wisconsin contain the words "public school" in conjunction with each other, and as so used seem to have a more limited meaning.

Section 1 of Article 10, of the Constitution of Wisconsin vests the supervision of public instruction in a state superintendent and such other officers as the legislature shall direct. The legislature has interpreted this provision of the constitu-

tion by placing the common schools and the free high schools under the supervision of the state superintendent. The meaning of the words, "public school" as used in our statutes may be noted by a few examples:

Chapter 439, Laws of 1901, in fixing the qualifications of teachers, provides that teachers in certain graded schools shall have had one year's successful experience as a teacher in the public schools of Wisconsin. These words as here used evidently apply only to the common schools and free high schools.

The same may be said of these words as used in Chapter 69, laws of 1903, which also relates to the qualification of teachers.

Chapter 171, laws of 1901, requires that graduates of colleges and universities in order that their diplomas may become an authorization to teach in the public schools of this state, shall present them to the state superintendent of public instruction for counter signatures and shall at the same time present evidence of successful teaching for a certain time in the public schools. This provision has never been construed as applying to the state normal schools and state university. That is, a graduate of a normal school who had taught for many years perhaps in a normal school would not be entitled to have his diploma countersigned and thus become a life certificate to teach in the public schools until he had taught the required time in the public schools.

Section 702-a as amended by Chapter 351, Laws of 1899, provides that "No person shall be eligible to the office of county superintendent of schools, who shall not at the time of his election or appointment thereto have taught in the public schools of this state, for a period of not less than eight months, and who shall not at such time hold a certificate entitling him to teach in a public school therein," etc.

The words "public school" as here used could not possibly be construed to include any of the state charitable and penal institutions.

Section 509 Wis. Stats. of 1898, provides that the state superintendent may furnish to any school district or to any school or district department thereof, any copy of Webster's International Dictionary," upon certain conditions. The Section also provides that the state superintendent may also upon certain conditions sell the dictionary to any of the "charitable, educational, reformatory or penal institutions of the state."

This clearly indicates that the legislature has placed the common or district schools and the free high schools in a separate and distinct class from the educational institutions under the supervision of the state board of control.

Permit me to quote a few decisions from other states:

"Public schools, as these words are used in the Constitution and laws of Massachusetts are not limited to schools of the lowest grades. The words 'public schools' are synonymous with, 'common schools,' in the broadest sense as used in the constitutional amendment.

Jenkins vs. Inhabitants of Andover, 103 Mass. 94.

"Public schools as used in the constitutions, providing that all moneys raised by taxation in towns and city for the support of public schools shall be applied to and expended on no other schools than those which are conducted according to law, cannot be construed as applying to the higher seminaries of learning such as academies and colleges."

Merrick vs. Inhabitants of Amherst, 94 Mass. 500.

"The term 'public school' as used in a deed conveying land to the inhabitants of a town for the establishment of a public school, does not include a state normal school. Applicants for admission to this are required to sign a declaration to teach in the public schools of the state."

Board of Regents vs. Painter, 102 Mo. 464.

"In a statute providing that the board of education in each state shall select the best scholars from each academy and each public school of their respective counties or cities as candidates for the university scholarship, by the words 'public school' the legislature intended common schools only and normal schools are not included. It is true that in an enlarged sense normal schools are public schools in as much as any citizen of the state possessing requisite qualifications and being selected as provided by law, may be admitted to them. In the same sense colleges are public schools, but clearly they are not embraced in the act. The object of normal schools is to give instruction in the art of teaching. The distinction between them and the common schools is marked."

Gordon vs. Cornes. 47 N. Y. 608.

In the section under consideration the legislature has used the words "All presidents, deans, principals, professors, in-

structors, scientific staff of teachers in the university, normal or public schools." Had the law makers intended the use of these words in their broadest meaning they would instead of using the words 'or public school' have said *and other public schools of the state*. It is clear to my mind that the legislature has used the words "public schools" in Chapter 363, Laws of 1905, in the same restricted sense in which they are found so many times in the statutes of the state.

I am, therefore, of the opinion that the provision of this chapter placing teachers in the university, normal or public schools in the unclassified list, does not include teachers employed in the state institutions under the supervision of the state board of control.

I am also of the opinion that the words "public schools" as used in this chapter do not apply to the state university and to the state normal schools.

Yours very truly,

L. M. STURDEVANT,

Attorney General.

December 15, 1905.

HONORABLE F. E. DOTY,

Secretary & Chief Examiner,

State Civil Service Commission.

DEAR SIR:—In your letter to me of December 14th you ask my opinion "as to the exact day and hour on which the state civil service law, chapter 363, laws of 1905, goes into full operation as provided for in section 2, which reads: 'After the expiration of six months from the passage of this act no person shall be appointed, transferred, removed,' etc."

In reply I will say that I have given the subject presented careful, though somewhat hurried consideration; and, while the authorities I have found abundantly satisfy me as to the conclusion herein stated, there may be some additional authorities on the same subject; but I am well satisfied that the trend of authorities is all in one direction, and that, if any additional ones may be found, that would not change the rule of law which appears to be very firmly established.

The first portion of your question involves the determination of the meaning of the words "passage of this act." Under the

constitution of this state (art. VII., sec 21,) general laws are not given effect until they are published, and, until such acts are published, they are of no effect. The act in question was passed by both houses of the legislature, approved by the Governor June 14, 1905, and was published June 16th, 1905.

As the law recognizes no division of a day, the words "passage of the act," used in section 2 thereof will be construed to mean that the time when the act should go into full operation as stated in said section would be six months from the day of its passage; that is, the first day to be counted in the specified six months would be the day following the passage of the act.

Parkinson v. Brandenburg, 35 Minn 294.

I find a contrary decision: People v. Clark, 1 Cal. 406; but in that case, there was a dissenting opinion by one of the judges, who held as was held in the Minnesota case, and I am constrained to follow the Minnesota decision rather than the California decision upon this question.

We now come to consider the point of time meant by the use of the words "passage of this act." Usually statutes of this kind use the words "passage and publication" if it is desired to have the computation run from the time the act goes into effect, but the word "passage" has been construed in a number of cases to mean the time that the act goes into effect, i. e., becomes a law.

In the case of Wartman v. City of Philadelphia, 33 Pa. St. Rep. 202 on p. 208, the supreme court of that state, in discussing the meaning of the words "after the passage of this act," says:

"An act of the legislature is passed only when it has gone through all the forms made necessary by the constitution to give it force and validity as a binding rule of conduct for the citizens. Whether it receives the signature of the Governor or remains in his hands for ten days, or, being vetoed, is carried by a two-thirds vote of both houses, its passage is dated from the time it ceased to be a mere proposition, or bill, and passed into a law."

In the case of Charless v. Lumberson, 1 Iowa 435, the Supreme court of that state held that the words "prior to the passage" amounted to the same thing as if the legislature had used the word "heretofore," and that either expression must relate

to the time of taking effect, and not to the time of passage; and, in the case of *Rogers v. Vaas*, 6 Iowa, 405, the same court held that the provision in the act entitled "An act in relation to the swamp lands of the state," approved January 24th, 1857, which provides that the act shall not apply to actual settlers on said lands at the time of the passage of the act, has legal reference to the time of the taking effect of the act, and not to the time of its passage.

Both these decisions are mentioned with approval in the case of *Andrews v. St. Louis Tunnel R. Co.*, 16 Mo App. 299, on p. 312.

In the case of *Harding vs. People* (Colo.), 15 Pac. 727, on p. 729, the Supreme Court of the state of Colorado, in speaking of the words "after the passage of the act," say:

"Our attention is also called to sec. 5 of the act, which provides that the state board of medical examiners, within ninety days after the passage of the act, shall receive, through its president, applications for certificates and examinations. . . . In this section we are cited to sec. 19, art. V. of the constitution, which provides that 'no act . . . shall take effect until ninety days after its passage, unless in the case of an emergency. . . .' In the absence of any emergency clause, in view of this constitutional provision, the expression 'after the passage of the act,' as used in the law, can have but one meaning, viz., after the act goes into effect. In the construction of statutes, general terms are to receive such reasonable interpretation as leaves the provision of the statute practically operative."

In the case of *Logan v. State*, 3 Heiskell (Tenn.) 442, 445, the supreme court of that state, in discussing the section of the constitution of Tennessee relating to the use of the words "after its passage," say:

"By Section 20, of Article 11, it is declared that 'no law of a general nature shall take effect until forty days after its passage, unless,' etc.

"The meaning of this section is, that the law shall not take effect until forty days after it has become a law; that is, after it shall have received the approval of the governor. or, upon his refusal to approve, shall have been otherwise passed under the provisions of the constitution."

The same court in speaking of the same matter in the case of *Hill v. State*, 5 Lea (Tenn.) 725, on p. 729, say:

"The constitutional provisions establish as the present rule, that an act takes effect when the formality of enactment are actually complete under the constitution, and not sooner, even where the legislature says that it shall take effect from its passage. It is passed when the constitutional formalities are completed."

See also *State v. The Banks*, 12 Rich. (S. C.) 609.

In all the states from which the above decisions are cited, there appears to be no provision requiring the legislative acts to be published; but, as stated in this state, in order to give a legislative enactment effect, it must be published, and it does not become a law until so published.

I therefore conclude that chap. 363, laws of 1905, may properly be said to have been passed at the time the law was published on June 16th, 1905; that it would go into effect at the beginning of the following day: and that the six months period mentioned in sec. 2 of that act would begin on the morning of the 17th of June. Consequently, the said act would go into full operation, under the provisions of said section, at the beginning of the 17th day of December, 1905.

Trusting that what I have said fully answers your inquiry, I am

Very truly yours,

L. M. STURDEVANT,

Attorney General.

MADISON, Wis., Feb. 2, 1906.

HON. F. E. DOTY,

Secretary and Chief Examiner,

State Civil Service Commission,

Madison, Wis.

DEAR SIR:—In your inquiry of February 1st, at hand, you state:

"I would like your opinion on the following question for the guidance of this commission. Section 10, of the Civil Service Law provides that competitive examinations shall be free and open to all applicants who are citizens of the United

States. You have already given me, I think, an oral opinion at least, that when competitive examinations are held they are limited to citizens of the state. I have assumed that this provision is limited to competitive examinations only; am I right in that assumption?"

Replying to this, I will say that Section 10 of the Civil Service Law especially provides, that "competitive examinations shall be free and open to all applicants who are citizens of the United States and of the State of Wisconsin, and who have fulfilled the preliminary requirements stated in Section 11 of this act." So that in the statute itself the competitive examinations are limited to applicants who are citizens of the State of Wisconsin as well as citizens of the United States.

You state further:

"The specific question I have to ask relates to the provisions of Section 13 in which it is said 'that when no suitable person is on the eligible list, appointments may be made otherwise than from such list, and persons when so appointed shall have the same rights as though taken from such list.'

We have at present no eligible list for attendants in state institutions, and I have said to superintendents of institutions that they may go anywhere they please for attendants as long as this condition exists. Am I right in this matter? May superintendents of state institutions go out of the state for employes when the commission has no eligible list for the position in question?"

Replying to this latter part of your letter, I will say that Section 13 of chapter 363, Laws of 1905, the Civil Service Act, refers expressly to the charitable and penal institutions of the state and it provides as follows:

"In such institutions emergency appointments and appointments when no suitable person is on the eligible list may be made otherwise than from such list, and such persons when so appointed shall have the same rights as those taken from an eligible list, except that they may be subjected to such tests as to merit and fitness as shall be prescribed by the commission."

In general I think it may be said that the civil service act and the statutes and policy of the state is that offices or posi-

tions in that state should be filled by citizens of this state. Favors, if positions in the charitable and penal institutions may be deemed such, in general should be given to citizens of the state. On the other hand certain positions in such institution are not largely sought after as is evident by the fact that you have no persons' names on the eligible list or no eligible list for places. The well being of such institutions, the safety and proper care of persons confined therein, not only make it necessary for persons in charge of such institutions to promptly fill vacancies or make new employment in emergency cases, but the persons employed may be required to have certain peculiar personal qualifications not generally shared by others, as that it may frequently be desirable and even necessary to make appointments hurriedly and of persons peculiarly fitted for the position they are required to fill, and this the superintendents of such institutions might not be able to do, if their employes were absolutely limited to citizens of this state

Section 13 of the Statute above quoted appears to recognize this condition and make provision therefor and to put no limitation whatever upon the residence or citizenship of the employes to be engaged in such institutions when there are no persons upon the eligible list. Hence I conclude that the superintendents of such institutions may when such condition exists employ assistants without regard to their citizenship.

I take it that the civil service act is intended to improve and is certainly not intended to impair the public service in any respect whatever and if a condition arises in any of the state, penal or charitable institutions such as you present, I think the superintendents of such institutions should be given the widest scope and opportunity to employ competent persons to assist in taking care of the inmates of such institutions and that such is the intent, indeed the letter of the statute.

Trusting what I have said fully answers your inquiry, I am

Yours very truly,

L. M. STURDEVANT,
Attorney General.

February 3, 1906.

HONORABLE F. E. DOTY,

Secretary State Civil Service Commission.

DEAR SIR:—Your letter of the 2nd inst. has been received. You ask for my opinion as to whether or not the position of library clerk in the office of the State Superintendent of Public Instruction can be deemed to fall within the unclassified service, as provided for in section 8 of the civil service law.

The office of library clerk was created by section 165-b Wis. Stats 1898, which is as follows:

"He (the State Superintendent) may also appoint a library clerk, who shall, under his direction, aid in promoting the establishment, maintenance and control of school libraries."

Section 8 of chapter 363, Laws of 1905, defines the unclassified service and, among others, specifies

"all presidents, deans, principals, professors, instructors, scientific staff and other teachers in the university, normal or public schools, the library staff in any library maintained wholly or in part at state expense."

It was plainly the intention of the legislature to place in the unclassified service all librarians and assistant librarians in any library wholly or partially supported by the state.

February 6th, 1906.

State Civil Service Commission,

Madison, Wis.

GENTLEMEN:—I am in receipt of your communication in which you request my opinion as to whether or not the officers and employes in the state banking department fall within the unclassified service, under the provisions of Chapter 363, Laws of 1905, known as the Civil Service Act.

The question arises under the provisions of section 8 of said act, which provides:

"The civil service shall be divided into the unclassified service and the classified service. The unclassified service shall comprise: all officers elected by the people, * * * all officers and employes in any department for the creation of which a vote of two-thirds of all the members elected to each house is required."

Under the latter provision the question is, whether the officers and employes of the banking department fall within the exempt, or unclassified, service, as provided by the act.

I know of no department to which this language can be held to apply, unless it was intended to apply to the power conferred upon the legislature by the amendment to Section 4 of Article XI of the Constitution of Wisconsin. This amendment was adopted by the people of the state in 1902 and reads as follows:

"Section 4. The legislature shall have power to enact a general banking law for the creation of banks, and for the regulation and supervision of the banking business provided that the vote of two-thirds of all the members elected to each house, to be taken by yeas and nays, be in favor of the passage of such a law."

It is certain that this constitutional provision does not in terms provide for the creation of a banking department and requires a two-thirds vote to create it; but such a vote is required for the enactment of a "general banking law for the creation of banks," also "for the regulation and supervision of the banking business."

In pursuance of the authority conferred by the amendment, the legislature of 1903 enacted Chapter 234, which is entitled "An act for the creation of banks and for the regulation and supervision of the banking business." The title of this act clearly indicates the purpose of the legislature to have been to exercise the power granted by the amendment and, if, in carrying out that purpose and as a part of the power to regulate and supervise the business of banking, it created a banking department, then it did require a two-thirds vote of the legislature in order to pass an act conferring upon the banking department power of regulation and supervision; but it did not necessarily require that the banking department itself be created by a two-thirds vote of the legislature. The legislature might have exercised the power of regulation and supervision of the banking business in some other way than by the creation of a state banking department. For example: the act might have provided that the regulation and supervision of the banking business should be vested in the Secretary of State, or some other state officer, but an act so providing must, in order to be valid, receive a two-thirds vote of the legislature. The amendment referred to does not restrict the legislature to any particular mode

of procedure in providing for the regulation and supervision of the banking business. It does not provide that a banking department shall be created by the act referred to. However, the legislature did create a banking department and provided, among other things, as follows:

"Section 1. There is hereby established in this state a banking department, which shall have charge of the execution of the law relating to banks and the banking business in this state. Such department shall be designated as the state banking department, and shall be under the management and control of a chief officer, who shall be called the commissioner of banking."

The act then provides for the appointment by the Governor, by and with the consent of the senate, of a Commissioner of Banking, and for a deputy, the employment of examiners and clerks to assist him in the performance of his duties. Thus far it seems clear that the legislature has not attempted in any way to provide for the regulation or supervision of the banking business; but, later on in the act, these powers are carefully set forth and conferred upon the Commissioner of Banking and his subordinate officers.

It seems, therefore, that there can be no doubt but that the legislature had the power to enact this chapter, under the authority conferred and, for that purpose and as a part of the scheme, it created a banking department, to be used as a means of regulation and supervision of the banking business in this state.

Considering, also, the history of this legislation, it seems clear that later, when the legislature enacted that all officers and employes in any department for the creation of which a vote of two-thirds of all members of each house is required shall be in the unclassified service, it referred to the state banking department, which had been created and existed at the time.

I say this is apparent from the history of the legislation, but it is not so apparent that the legislature, by the words of the act referred to accomplished that purpose. In construing a statute, we must take it as we find it. It is not permissible to inject into the words of a statute any meaning which cannot be gathered from the context taken in connection with other legislation on the same subject. The office of interpretation

is to arrive at the intent of the legislature, but that intent must be derived from the words used by it, and not from extraneous facts. The act referred to exempts the officers and employees in any department for the creation of which a vote of two-thirds of all the members elected to each house is required, and we have seen that there is no department of this state where a two-thirds vote of the legislature is required to create it.

"The language of a statute is its most natural expositor; and, where its language is susceptible of a sensible interpretation, it is not to be controlled by extraneous considerations.

* * * We are not at liberty to imagine an intent and bind the letter of the act to that intent; much less can we indulge in the license of striking out and inserting and remodeling, with the view of making the letter express an intent which the statute in its native form does not evidence. Every construction, therefore, is vicious which requires great changes in the letter of that statute, and, of the several constructions, that is to be preferred which introduces the most general and uniform remedy. The legislature must be understood to mean what it has plainly expressed, and this excludes construction."—Sutherland on Statutory Construction, Sec. 237.

In view of these well known rules of construction, it seems impossible to read into the language of this act the idea that it refers to the banking department of the state. In my opinion there is no room for construction. The act plainly refers to a department of the state for the creation of which a two-thirds vote of the legislature is required. The fact that there is no such department might incline a court to give a very liberal construction to the words used, in order to give some meaning to the act of the legislature; but, in my opinion, it is not permissible to read into this act the words "banking department." I am therefore of the opinion that no act of the legislature has placed in the unclassified service the officers and employees of the banking department, except that, under other provisions of the act, the Commissioner of Banking, who is appointed by the Governor, falls within such class, and also his deputy, and stenographer.

Yours truly,

L. M. STURDEVANT,
Attorney General.

February 20, 1906.

HONORABLE F. E. DOTY,

Secretary State Civil Service Commission.

DEAR SIR:—Your letter of the 19th inst. has been received. You state that the Civil Service Commission has found that it is impracticable to fill certain positions by competitive examinations at the present time, and you ask whether the Commission may legally place such positions in the exempt class for a limited time.

In reply I will say that sec. 14, chap. 363, Laws of 1905, provides that, in addition to the positions therein enumerated,

“there may be included in the exempt class all other offices or positions except laborers, for the filling of which competitive or non-competitive examinations shall be found by the civil service commission to be impracticable on account of the temporary character of the employment.”

I am of the opinion that, under this authority, the Civil Service Commission may place such positions as in its judgment it is impracticable to fill by competitive examinations, temporarily in the exempt class. It is possible that the impracticability of filling such positions by examination may be later overcome.

I think this is a matter for the judgment of the Commissioners. I believe that they have the authority under the law to make temporary exemptions in all cases where they make permanent exemptions, if their judgment so directs.

Yours very truly,

L. M. STURDEVANT,
Attorney General.

March 26, 1906.

State Civil Service Commission,

Madison, Wis.

GENTLEMEN:—I am in receipt of your communication of the 23d inst., in which you ask my opinion upon the following:

“Are boards of visitors, appointed by the State Superintendent, without pay, to visit normal schools and report to the State Superintendent or local examiners for the Civil

Service Commission, appointed without pay, to conduct local examinations, subject to the civil service law, or in any way subject to the jurisdiction of the Civil Service Commission?"

In my opinion, these positions do not fall within either the letter or the spirit of the law, and are not within the civil service act. They do not fall within either the classified or the unclassified service named in section 8 of the act. They are not public officers within the meaning of the act, for such are defined by the words of the act,

"to include all public officials of this state, whether paid directly or indirectly from the public treasury of the state or by fees or otherwise."

The boards of visitors named serve without pay, as do the local examiners, and therefore these do not fall within this definition. They are not public employees within the meaning of the act, for such are defined,

"to include every person not being an officer who is paid from said treasury of the state"

Yours truly,

L. M. STURDEVANT,
Attorney General.

June 29, 1906.

HONORABLE F. E. DOTY,

Secretary State Civil Service Commission.

DEAR SIR:—I am in receipt of yours of the 29th inst. in which you ask my opinion as to the validity of Rule 10 adopted by the Civil Service Commission.

Sec. 19 of Chapter 363, laws of 1905, provides that any person who has held a position by appointment under civil service rules and who has been separated from the service without any delinquency or misconduct on his part may be reinstated within one year from the date of such separation to the same or similar position in the same department, provided, that, for the original entrance to the position proposed to be filled by such reinstatement, there is not required in the opinion of the civil service commission examination involving essential tests or qualifications different from or higher than those involved in

the examination for the original entrance to the position formerly held by the person proposed to be reinstated.

Under this provision of the statute you have made and adopted a rule which provides that the names of all persons who have held positions in the competitive class by appointment under civil service rules and who have been separated from the service through no delinquency or misconduct and who have been recommended by the appointing officer for preference shall be entered upon the lists of suspended employes and shall remain thereon for a period of one year and, upon notice of a vacancy in the same or similar position in any department, names from such lists of suspended employes shall be certified in preference to names from the eligible list.

Under these circumstances you ask me whether this rule is in accordance with law?

You will notice that the statute provides that a person who has held any appointment under civil service rules and has left the service under the circumstances named in the statute may be reinstated. The statute could not well use the term "shall be reinstated," because there might be no occasion for his reinstatement—no position for him—but he is to be reinstated in the same or similar position in the same department, and your rule provides that he may be reinstated in the same or similar position in any department. This word "any" in my opinion, does not necessarily mean any other department; that is, a department other than the one from which he left; but, if it is subject to such construction, it is clearly not in accordance with the statute, because that plainly provides that he may be reinstated in the same department. I see no necessity for a new rule, but the rule should be construed as it was evidently intended to mean: *in the same department*, instead of *any other department*.

Your second question is, Was it competent for the Commission to adopt such a rule?

Of course, the rule cannot control the statute, but the statute must control the rule. If you mean by the rule, that the suspended officer may be reinstated in any other department than the one from which he was suspended, then my answer is that the Commission could not adopt such a rule legally.

Yours truly,

L. M. STURDEVANT,

Attorney General.

July 19, 1906.

HONORABLE F. E. DOTY,
Secretary and Chief Examiner,
State Civil Service Commission,
Madison, Wis.

DEAR SIR:—Your letter of the 1st inst. has been received. You state that officials and employes of the state wish to know more specifically whether they have a right, under the civil service law, to circulate nomination papers for the candidates of their choice, and ask for an interpretation of the phrase "political service" as used in section 28, chapter 363, laws of 1905.

The words "political service" are used in section 28 in this connection:

"No officer, agent, clerk or employe under the government of this state shall directly or indirectly, solicit or receive, or be in any manner concerned in soliciting or receiving any assessment, subscription or contribution, or political service, whether voluntary or involuntary, for any political purpose whatever, from any officer, agent, clerk or employe of the state."

In the absence of judicial definition, the words "political service" should be given their ordinary and usual meaning. Webster's International Dictionary defines "political" as, "Of politics, or relating to politics." and one of the definitions given to the word "politics" is, "The advancement of candidates to office." The word "service" is defined as, "The performance of labor for the benefit of another." Taking these definitions together, the words "political service" as used in the law may be defined as, The performance of labor for the advancement of candidates to office. The circulation of a nomination paper is certainly the performance of labor for the benefit of another. The purpose of a nomination paper is to advance a candidate to office. Under the primary election system of nominating candidates, no greater service may perhaps be rendered to such candidates than by the circulation of their nomination papers.

I am therefore of the opinion that, according to the provisions of this section, no officer, agent, clerk or employe under the government of the state should solicit or receive political service, such as the circulating of nomination papers, from any officer, agent, clerk or employe of the state.

It was not the purpose of the Legislature as expressed in the civil service law to in any way abridge the rights of citizenship of the persons coming within the provisions of the law. Employes of the state have the same right as formerly to freely express their opinions upon political subjects and their preferences for candidates for office, but I believe the law plainly prohibits the acceptance of such political service as the circulating of nomination papers from state employes.

Yours truly,

L. M. STUDEVANT,
Attorney General.

Aug. 7, 1906.

HONORABLE F. E. DOTY,
*Secretary and Chief Examiner,
State Civil Service Commission.*

DEAR SIR:—Your communication of July 31st has been received. You have asked me this question:

“Did the Civil Service Commission have the authority under the law to make and enforce section 8 of rule 10 of the civil service rules, which reads as follows: ‘In accordance with the provisions of section 16 of the law, any veteran of the late Civil War who has attained the required percentage for eligibility shall be given such preference in registration as the addition of five per cent to his average standing would entitle him to?’”

Section 16 of chapter 363, Laws of 1905, contains this provision:

“Whenever eligibles are certified, they must also be those candidates who have been graded highest in an examination held in pursuance of this act and the rules made in accordance therewith, except that, where practicable, other conditions being equal, the rule shall provide for a preference in favor of veterans of the late Civil War.”

I am of the opinion that the rule which you have quoted is a legal and reasonable interpretation of this provision. I understand that the rule gives no preference to veterans at the examination, but, after an examination, other conditions being equal, they are given such preference as the addition of

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five per cent in standing would entitle them to. I believe that section 16 gives legal authority to the Commission to make and enforce such a rule.

Very truly yours,
L. M. STURDEVANT,
Attorney General.

September 22, 1906.

HONORABLE F. E. DOTY,
Secretary and Chief Examiner,
State Civil Service Commission,
Madison, Wis.

DEAR SIR:—Your communication of the 21st inst. has had careful consideration. You say that the State Civil Service Commission desires my opinion as to the extent of the powers of the Commission to control or check removals from the civil service and ask three specific questions, to wit:—

Question 1. "In case complaint is made by an employe that the reason for his dismissal is political or religious, what, in your judgment, is the proper procedure? If an investigation is the proper procedure and if, upon investigation, the Commission finds that the removal is for political or religious reasons, what action is then to be taken? Has the Commission of itself power to reinstate or must this matter rest with the courts? Does the Commission have any power of initiative after finding that the law has been violated? If so, what? Should the Commission bring action in the courts or is it proper to leave initiative to the plaintiff?

Question 2. "If complaint is made that the cause is insufficient, that dismissal is unjust and not for political or religious reasons, must the Commission (or should the Commission) accept the written reason of the officer as final or may the Commission hold an investigation as to the merits of the case? If so, can the Commission, if, in its judgment, the employe has been unjustly dismissed for what, in its opinion, is an insufficient cause, reinstate the employe or take any other steps in reference to protecting his rights?

Question 3. "Section 13 provides that the provisions of this act with reference to removal, suspension, etc., shall not be applicable in such case (penal and charitable institutions) except that they shall be made for just cause which shall be neither religious nor political. Does this provision free the

superintendent of an institution from filing his reasons with the Commission?

“(a) If an employe complains that he has been dismissed for what seems to him insufficient cause, is it competent for the Commission to hold an investigation in such case to determine whether the cause is just?

“(b) If so, and if, upon investigation, the Commission finds that, in its opinion, the cause is not just, what action may then be taken by the Commission? May the Commission reinstate the employe or refuse to certify the salary of the one appointed to his place? Or is the question one entirely for the courts to decide?”

Section 363 of the Laws of 1905 provides that:

“No subordinate or employe in the competitive class, non-competitive class or the labor class of the civil service of the state, who shall have been appointed under the provisions of this act or the rules made pursuant thereto, shall be removed, suspended for more than fifteen days, discharged, or reduced in pay or position, except for just cause, which shall not be religious or political. In all cases of removal the appointing officer shall, at the time of such action, furnish to the subordinate his reasons for the same and allow him a reasonable time in which to make an explanation. The reasons for removal and the answer thereto shall be filed in writing with the commission.”

Sec. 30 makes the violation of this law by an appointing officer a misdemeanor and provides as a penalty the vacation of his office and disqualifies him from holding office for the period of five years.

The State Civil Service Commission is a creature of the statutes and it has no other powers than those given to it by statute. It cannot take authority by implication or presumption. The Commission is a part of the executive branch of the state government. Its chief duty is to enforce the law relating to the appointment and removal of persons in the civil service of the state. The purpose of the civil service law is to provide for the appointment of state employes according to merit and fitness and to prevent their appointment because of political or religious considerations. It is the duty of the Commission to see that this purpose as expressed in the law is fulfilled. However, the Legislature has not directly conferred judicial powers

upon the Commission. It has not constituted it a court to hear testimony and to determine questions of fact or law. The Civil Service Commission is directed by law to certify to the Secretary of State the list of persons upon the pay-roll of the state. When the head of a department removes an employe, he must file with the Commission a statement in writing of the reasons for the removal and the dismissed employe's answer thereto. The Commission must determine whether the reasons given in such statement are political or religious and whether or not, *upon their face*, they constitute just cause for removal. If the reasons stated are neither political or religious and constitute upon their face just cause for removal, then the Commission may not go behind such statement, to determine whether or not the facts stated be true, for the purpose of reinstating the deposed employe. The Commission has no power to reinstate an employe when it appears upon the face of the returns that he has been dismissed for just cause. If the aggrieved person believes that the statement filed with the Commission is not true, or that the reasons given are not the real reasons for his removal, then he may appeal to the courts for the establishment of his rights. The writ of mandamus provides a quick remedy to the aggrieved person. It is not the duty of the Civil Service Commission in such a case to take the initiative; the controversy is between the removing officer and the deposed employe. If an officer attempts to remove an employe for political or religious reasons or for an unjust cause and the statement filed with the Commission shows that the reasons were political or religious, or that the cause for removal was unjust, then there has in fact been no removal and the Commission should so certify to the state auditor. The truth of the facts given in the statement is not for the Commission to determine; that is for the courts.

Concerning your question relating to removals in the penal and charitable institutions: Sec. 13 provides that the provisions of that law with reference to removals shall not apply to such institutions. The provision requiring statement to be filed relates to removals. I am therefore of the opinion that the superintendent of a charitable or penal institution is exempt from filing his reasons for removal with the Civil Service Commission.

Yours respectfully,

L. M. STURDEVANT,
Attorney General.

COURT DECISIONS.

STATE ex rel. BERGH v. SPARLING et al. (Supreme Court of Wisconsin. June 21, 1906.)

1. STATES—OFFICERS—APPOINTMENT—CIVIL SERVICE COMMISSION.

The officers and employes in the banking department, created by Laws 1903, p. 351, c. 234, providing for the creation of banks and the supervision of the banking business, establishing a banking department under the control of the commissioner of banking, with power to appoint subordinate officers and employes and with power to supervise the banking business, adopted pursuant to Const. art. 11, § 4, 5, as amended in 1902, conferring on the Legislature power to enact a general banking law, provided that the vote of two-thirds of all members elected to each house favor the passage thereof, are within Laws 1905, p. 574, c. 363, § 8, providing that the unclassified civil service shall comprise officers and employes in any department for the creation of which a vote of two-thirds of the members elected to each house of the Legislature is required, and such officers and employes are not subject to the provisions of the act with respect to the classified civil service of the state; the creation of the banking department and the officers and employes thereof being a part of the general banking law for the creation of banks and the supervision of the banking business.

2. CONSTITUTIONAL LAW—PERSON ENTITLED TO RAISE CONSTITUTIONAL QUESTIONS.

An officer not subject to the civil service law (Laws 1905, p. 570, c. 363) cannot raise the question of the unconstitutionality of the act; he not being affected by its enforcement.

[Ed. Note.—For cases in point, see vol. 10, Cent. Dig. Constitutional Law, § 39.]

Original action by the state, on the relation of Marcus C. Bergh, against S. E. Sparling and others, constituting the civil service commission of the state, to prohibit defendants from enforcing the provisions of the civil service law thereof with respect to relator as commissioner of banking and employes in the state banking department. Writ issued.

This is an original action in this court. It was brought by the relator, who holds the office of commissioner of banking,

upon leave granted him by the court.. It is alleged that the relator is the duly appointed and acting commissioner of banking under the authority of chapter 234, p. 351, of the Laws of 1903, which, pursuant to the amendment of sections 4 and 5 of article 11 of the Constitution of the state, provides for the creation of banks and for the regulation and supervision of the banking business, and that his deputy, the examiners, and the clerks of the banking department are in the possession and performing the duties of the respective offices and positions created and imposed by the provisions of the act. It is further alleged that the defendants are the civil service commissioners of this state, that they are exercising the powers and duties imposed on them by chapter 363, p. 570, of the Laws of 1905, and that they have made demand upon the relator and all other persons now holding offices and positions in the banking department, as incumbents of such offices and positions within the classified service of this state under its provisions, to comply with all the terms and conditions of the civil service law, and that they threaten to subject the examiners and clerks of the department to the examination prescribed by it as a requisite to entitle them to continue in the employ of the state, and that, in case of relator's refusal, as an appointing officer under its terms, and the refusal of the employees of the state in this department, as employees within the jurisdiction of its provisions, to comply with the provisions of this law, the commission threaten to enforce as against the relator and such officers and employees of this department the penalties provided therein for failure to conform to them and to comply with the conditions imposed upon persons within the classified civil service of the state. It further alleges that this threatened enforcement of the civil service law as to this department would prevent the enforcement of the regulations and the supervision of the banking measures of this state as prescribed by law, and cause great and irreparable injury to the public and the state. Relator therefore demands that the civil service commission be prohibited from enforcing the provisions of the law as regards himself, as commissioner of banking, and all other persons in the employ of the state in the state banking department. The defendants demurred to the relation and moved to quash it, upon the ground that it appears upon the face of the relation that the facts stated allege no grounds for the issuance of the writ

of prohibition, that the facts stated show that defendants are vested with authority and power to carry out the provisions of chapter 363, p. 570, of the Laws of 1905, and that the relator and all other officers and employes in the banking department of the state are subject to their jurisdiction, as persons holding offices and positions of trust or employment in the classified civil service of the state within the terms and provisions of this law.

R. M. Bashford, for plaintiff. L. M. Sturdevant, Atty. Gen., A. C. Titus, Asst. Atty. Gen., and Edward W. Frost (Olin & Butler, of counsel), for defendants.

SIEBECKER, J. (after stating the facts). Upon the demurrer to the relation and the motion to quash it, the contention is made that it appears from the facts alleged that no sufficient grounds are presented for the issuance of a writ to prohibit the defendants, as civil service commissioners, from proceeding to enforce the provisions of chapter 363, p. 570, Laws 1905, against relator and all the other officers and employes of the banking department, as within the classified civil service of the state under the terms and provisions of the act. It is obvious that the Legislature has undertaken to classify the civil service of the state and to provide for appointment to and promotion therein according to merit and fitness, to be ascertained, so far as practicable, by appropriate competitive examinations, and to that end created a civil service commission, charged with the duties and powers necessary to carry into effect the provisions of this act. The jurisdiction of this commission extends to and covers the prescribed classified civil service. Appointments in the unclassified civil service are not subject to the terms and conditions of the act. Relator avers that under section 8 (page 574) of the act all officers and employes in the state banking department are within the unclassified civil service of the state. This section provides: "The civil service shall be divided into the unclassified service and the classified service. The unclassified service shall comprise," among others, "all officers and employes in any department for the creation of which a vote of two-thirds of all members elected to each house is required." It must then be determined whether relator and the other officers and employes serving in the bank-

ing department of the state, as created and established by chapter 234, p. 351, Laws 1903, are within the unclassified civil service. This act is entitled: "An act for the creation of banks and for the regulation and supervision of the banking business." It is manifestly enacted pursuant to the calls of the amendment to sections 4 and 5 of article 11 of the state Constitution, ratified and adopted in 1902, which is as follows: "Sec. 4. The Legislature shall have power to enact a general banking law for the creation of banks, and for the regulation and supervision of the banking business, provided that the vote of two-thirds of all members elected to each house, to be taken by yeas and nays, be in favor of the passage of such law." The intent and scope of this provision are obvious from the language employed, which imports that the people thereby expressly delegated to the Legislature the power to create banks and to provide for their regulation and supervision. The occasion for such specific delegation of power by the people to the Legislature is manifest from the history of these constitutional provisions. Originally the people reserved to themselves the control of the creation of banks under the provisions of sections 4 and 5 of article 11 of the Constitution, which declared that: "The Legislature shall not have power to create, authorize or incorporate, * * * any bank, or banking power or privilege, or any institution or corporation having any banking power or privilege whatever," except with the consent of the people expressed by ballot, and then any law granting such power should be inoperative until approved by a vote of the electors at a general election. These provisions were abrogated by the adoption by the people of the above amendment at the general election in 1902, whereby unrestricted power over the subject of banking was given to the Legislature, both in respect to the creation of banks and the regulation and supervision of the banking business.

The first legislative action, exercising the right to frame laws under the power thus conferred, is embodied in chapter 234, p. 351, of the Laws of 1903, which provides for the creation and maintenance of banks and the supervision of the banking business. It seems that the legislature intended to cover these subjects in detail and to provide a legislative scheme for the exercise of the powers conferred by the constitutional amendment. As a part of the general plan and scheme to ac-

comply with this purpose, subchapter 1 of this act establishes "a banking department, which shall have charge of the execution of the laws relating to banks and the banking business," and which is to be "under the management and control of a chief officer who shall be called the commissioner of banking," who is given power to appoint a deputy, examiners, and clerks to assist in the administration of the affairs of the department. In other parts of the act power is expressly conferred on the commissioner to examine annually "the cash, bills, collaterals, securities, books of account, condition and affairs of each bank, and mutual savings bank doing business in this state except national banks." For this purpose he may administer oaths to persons to be examined by him, and determine whether banks do their business at the places fixed by their charters and according to prescribed regulation. He is given power to demand of any bank that it make good any impairment or deficiency in its capital stock, and, in case of non-compliance with his demand, he is to make report thereof to the Attorney General of the state to secure the appointment of a receiver and the winding up of the bank's affairs. He is also authorized to take possession of a bank's books, records, and assets, whenever it unlawfully refuses to pay its depositors in accordance with the terms on which their deposits were made, or if the bank is insolvent, and to hold them until they can properly be turned over to a receiver. In all cases where banks fail to keep books and accounts in such a manner as to enable him to readily examine and ascertain its condition, he is empowered to prescribe the keeping of such books and accounts as shall be necessary to record the transactions of the banks, and, whenever the banking business of different banks is conducted in such close proximity as to interfere with their proper examination or supervision, he may require any of such banks to remove its banking offices to some other location. It is made his duty to make a full report each year to the governor; such report exhibiting the condition of the various banks as to amount of capital returned by them, their liabilities and total resources, and giving other information as required, pertaining to the banking business of the state. It is evident from these and kindred provisions of this act that the creation of the banking department and the establishment of the office of commissioner of banking was designed and intended as part of a gen-

eral banking law for the creation of banks and for the regulation and supervision of the banking business. The powers so conferred afford the strongest evidence that the establishment of the department with the commissioner in its charge is a part of the general scheme and purpose of the Legislature to accomplish the purposes and to exercise the power conferred by the constitutional provision. It is not suggested that the scheme thus adopted is not an appropriate method for attaining effective regulation and supervision of the banking business. It seems that a proper administration of these powers requires an instrumentality like this department to carry out efficiently the legislative action on this subject, and that this makes it an integral and necessary part of the legislative scheme for the control of the banking business. Upon these considerations, the conclusion seems inevitable that the creation of this department with the office of commissioner of banking, by chapter 234, p. 351, Laws 1903, required the affirmative vote of two-thirds of all members elected to each house of the Legislature in favor of the passage of the law, and that the department officers and employes are embraced in the unclassified civil service of the state, as prescribed by chapter 363, p. 570, Laws 1905, and hence are not subject to the power, duties, and authority vested in the civil service commission. Defendants therefore cannot subject them to their jurisdiction and must be prohibited from enforcing the provisions of the act, as threatened, against them.

The question suggested upon the argument and fully presented in the respective briefs of counsel, as to whether or not the provisions of the civil service act are violative of any constitutional provisions, require no discussion here, since relator is not subject to the provisions of the act, and can in no sense be affected or injured by the enforcement of its provisions.

Judgment is ordered that an absolute writ of prohibition issue forthwith, commanding the defendants, as members of the state civil service commission, to absolutely refrain from proceeding to enforce any of the powers vested in them by chapter 363, p. 570, of the Laws of 1905, or any of the penalties prescribed by this act against relator or any other officer or employe in the banking department of the state, without costs; the relator to pay the fees of the clerk of this court.

PART VI.

The Civil Service Law of Wisconsin.

THE CIVIL SERVICE LAW.

Chapter 363, Laws of 1905.

DEFINITIONS.

SECTION 1. When used in this act:

1. The term "commission" signifies the state civil service commission.

2. The term "civil service", signifies all offices and positions of trust or employment, including mechanics, artisans and laborers, in the service of the state, except offices and positions in the militia.

3. The term "appointing officer" signifies the officer, commission, board or body, having the power of appointment, or election to, or removal from, subordinate positions in any office, department, commission, board or institution.

4. The terms "subordinate" and "employee" signify any person holding a subordinate position subject to appointment, removal, promotion or reduction, by an appointing officer.

GENERAL PROVISIONS.

SECTION 2. After the passage of this act, appointments to, and promotions in the civil service of this state shall be made only according to merit and fitness, to be ascertained as far as practicable by examinations, which so far as practicable, shall be competitive. After the expiration of six months from the passage of this act, no person shall be appointed, transferred, removed, reinstated, promoted or reduced as an officer, clerk, employee or laborer in the civil service under the government of this state, in any manner, or by any means, other than those prescribed in this act.

STATE CIVIL SERVICE COMMISSION; HOW CREATED;
COMPENSATION.

SECTION 3. As soon as this act shall go into effect the governor shall, by and with the advice and consent of the senate, appoint three persons to serve, one for six years, one for four years, and one for two years, as civil service commissioners, and the said three commissioners shall constitute the civil service commission of this state. Every alternate year thereafter, the governor, with the consent of the senate, shall appoint one person as the successor of the commissioner whose term shall expire, to serve for the term of six years from the date of the appointment, and until a successor is appointed and qualified. The governor may remove any commissioner at any time for inefficiency, neglect of duty, or malfeasance in office.. At no time shall more than two commissioners be adherents of the same political party. Any vacancy in such commission shall be filled by appointment by the governor, subject to confirmation by the senate, but any appointment shall be in full force until acted upon by the senate. The commissioners shall hold no other lucrative administrative office under the United States or the state of Wisconsin. Each commissioner shall be paid ten (\$10.00) dollars per diem for the time actually and necessarily devoted to his official duties not exceeding one hundred days each year, and his necessary expenses incurred in the discharge of his official duties. Each commissioner shall qualify by filing with the secretary of state an oath to perform faithfully the duties of his office. . .

OFFICERS AND EMPLOYEES OF THE COMMISSION.

SECTION 4. The civil service commission may elect one of its members president, and may employ a chief examiner, who shall be ex-officio secretary, at a salary of \$2,500 per year, a stenographer at

Chief Examiner; compensation.

Local exam-
iners.

\$720 per year, and may employ such additional clerks or examiners as may be necessary at an expense not to exceed \$2,000 per year. Said employees shall be paid necessary expenses actually incurred in the discharge of their official duties. The commissioners may designate persons in or out of the official service of the state or of any city or county who shall, if in the service, with the consent of the head of department or office in which such person serves, act as local examiner. Such persons in the official service in the performance of such duties as the commission shall direct, shall be under the direct and sole control of the commission, and their duties shall be considered part of the duties of the office in which they are serving, and time shall be allowed therefor during office hours and no extra compensation shall be paid such officers for such service.

ROOMS, ACCOMMODATIONS AND SUPPLIES.

Salaries and
expenses:
how paid.

SECTION 5. The commission shall be provided with suitable office accommodations in the capitol building at Madison, and it shall be the duty of the officials having control of municipal and county buildings to furnish convenient offices and rooms for examinations, and necessary furniture, heat and light, for the accommodation of local examiners and registrars upon requisition by the commission. The commission shall be furnished by the state superintendent of public property with stationery, printing, supplies, postage and an official seal, and other articles which it may require. All salaries, expenses and disbursements of the commissioners and their subordinates and employees, shall be paid out of the state treasury, as the salaries and expenses of other state officers are paid, and a sum sufficient to carry out the provisions of this act, not exceeding the sum of ten-thousand dollars per annum, is hereby appropriated.

PUBLIC OFFICERS' DUTIES.

SECTION 6. It shall be the duty of all officers of this state to conform to and to comply with and to aid in all proper ways in carrying into effect the provisions of this act and the rules and regulations prescribed thereunder and any modification thereof. No appointing officer shall, after six months from the date of the passage of this act, select or appoint any person for appointment, employment, promotion or reinstatement, except in accordance with the provisions of this act and the rules and regulations prescribed thereunder. Any person employed or appointed contrary to the provisions of this act or of the rules and regulations established thereunder, shall be paid by the officer or officers so employing or appointing, or attempting to employ or appoint him, the compensation agreed upon for any service performed under such appointment or employment, or attempted appointment or employment, or in case no compensation is agreed upon, the actual value of such services and any expenses incurred in connection therewith, and shall have a cause of action against such officer or officers, or any of them, for such sum or sums and for the costs of the action. No public officer shall be reimbursed by the state for any sums so paid or recovered in any such action.

Restrictions
on the power
of appoint-
ing officers.

Penalty for
appoint-
ments con-
trary to law.

POWERS OF THE COMMISSION TO MAKE AND ENFORCE
RULES AND REGULATIONS.

SECTION 7. The civil service commission shall:

First. Prescribe, amend and enforce rules and regulations for carrying into effect the provisions of this act. All rules so prescribed shall be subject to the approval of the governor, and they may from time to time, subject to like approval, be added to, amended or rescinded, provided however, that if the governor takes no action on a rule or amendment submitted to him within a period of ten days from

The Civil Service Law.

the date of its submission, then the rule or amendment shall become effective as though approved by the governor.

Records.

Second. Keep minutes of its own proceedings and records of its examinations and other official actions. All recommendations of applicants for office received by the said commission, or by any appointing officer, shall be kept and preserved by the commission, and all such records, recommendations of former employers excepted, and all written causes of removal and answers thereto filed with it, shall, subject to reasonable regulations, be open to public inspection.

Power to investigate the enforcement of law, rules or regulations.

Third. Make investigations, either sitting as a body or through a single commissioner, concerning all matters touching the enforcement and effect of the provisions of this act, and the rules and regulations prescribed thereunder concerning the action of any examiner or subordinate of the commission and any person in the public service, in respect to the execution of the act, and in the course of such investigations, each commissioner and the secretary and the chief examiner shall have the power to administer oaths and affirmations, and to take testimony.

Judicial powers.

Fourth. Have power to subpoena and require the attendance in this state of witnesses and the production thereby of books and papers pertinent to the investigation and inquiries hereby authorized, and to examine them and such public records as it shall require in relation to any matter which it has authority to investigate. In the discretion of the commission, fees may be allowed to witnesses, and on their certificate, duly audited, shall be paid by the state treasurer, for attendance and traveling as provided in section 4067 of the statutes of 1898. All officers in the civil service, and their deputies, clerks, subordinates and employees, shall attend and testify when requested to do so by said commission. Any disobedience thereto, or neglect of any subpoena issued by the said commissioners, or any one of them,

or their secretary or chief examiner, to any person, or the refusal of any witness to testify to any matter regarding which he may lawfully be interrogated, shall be held a contempt of court, and it shall be the duty of the circuit court of any county, or of the judge thereof, on application of the commission, or any commissioner, to compel the obedience by attachment proceedings for contempt, as in the case of disobedience of the requirements of a subpoena issued from such court, or a refusal to testify therein.

Fifth. Make a biennial report to the governor on or before the first day of December in each even numbered year, showing its own actions, and rules and regulations and all the exceptions thereto in force, and the practical effects thereof, and any suggestions it may approve for the more effectual accomplishment of the purposes of this act. It shall also give the names and separate compensation of all persons employed by the commission during the preceding year and the purposes of such employment. Such report shall be immediately printed for public distribution, and shall be transmitted to the legislature when next convened.

Biennial
report.

UNCLASSIFIED SERVICE.

SECTION 8. The civil service shall be divided into the unclassified service and the classified service. The unclassified service shall comprise: All officers elected by the people. All officers and employees appointed by the governor whether subject to confirmation or not. All officers and employees in any department for the creation of which a vote of two thirds of all the members elected to each house is required. All presidents, deans, principals, professors, instructors, scientific staff and other teachers in the university, normal or public schools, the library staff in any library maintained wholly or in part at state expense, the superintendent, warden or other head of the state reformatory, charitable and penal institutions. All persons ap-

The Civil Service Law.

pointed by name in any statute. All legislative officers. The classified service shall comprise all positions not included in the unclassified service.

POWERS AND DUTIES OF COMMISSION TO MAKE
CLASSIFICATION.

SECTION 9. Within six months after the passage of this act and the appointment of the civil service commissioners as herein provided, the commission shall put into effect rules for the classification of the offices, places and employments now or hereafter created in the classified service of this state. Within the same time the commission shall also make rules and regulations providing for examinations for positions in the classified service of the state, appointments to, removals from, and promotions and reductions therein, and for such other matters as are necessary to carry out the purposes of this act. Due notice of the contents of such rules and regulations and of any modifications thereof shall be given by mail in due season to appointing officers affected thereby, and said rules, regulations and modifications shall also be printed for public distribution. All original appointments to the competitive and non-competitive classes and the labor class of the classified service shall be for a probationary period of one, two or three months in the discretion of the appointing officer, but dismissal for cause may be made during such period. If at the close of this probationary term the conduct or capacity of the probationer has not been satisfactory to the appointing officer, the probationer shall be notified in writing that he will not receive absolute appointment; otherwise his retention in the service shall be equivalent to his final and absolute appointment. The commission shall require of all officers or employees at present in the civil service falling within the provisions of this law, as well as of all persons appointed after the passage of this act and before the rules shall take effect, except officers or employees of the

Probationary period.

Non-competitive examination of original incumbents.

several state reformatory, charitable and penal institutions, a non-competitive examination as a condition of continuing in the service longer than six months after the adoption of the rules provided for in this section. Reasonable notice of examinations shall be given to such officers and employees.

EXAMINATIONS.

SECTION 10. All examinations for positions in the classified service shall be practical in character, and shall relate to those matters which will fairly test the capacity and fitness of the persons examined to discharge the duties of the office or employment sought by them, giving due allowance for experience in the same or similar positions. The competitive examinations shall be free and open to all applicants who are citizens of the United States and of the state of Wisconsin and who have fulfilled the preliminary requirements stated in section 11 of this act, and shall be held at such times, and places as shall, in the judgment of the commission, most nearly meet the convenience of applicants and the needs of the service. Examinations of a technical or special character, or where requirements are peculiarly within the knowledge of the office, institution or department in which appointment is to be made, shall be proposed by the incumbent of such office or head of such institution or department, or by persons having knowledge and experience in the same or similar employments. It is the declared policy of the state that under the operation of this act there shall be a fair distribution throughout the state of persons accepted for the classified service, and to that end examinations shall be held simultaneously at a convenient point in each of the assembly districts in the state, and in the case of assembly districts embracing more than one county, at each of the county seats therein.

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APPLICATIONS.

SECTION 11. The civil service commission shall require persons applying for admission to any examination provided for under this act, or under the rules and regulations of the said commission, to file in its office a reasonable time prior to the proposed examination a formal application, in which the applicant shall state under oath or affirmation:

1. His full name, residence and post office address.

2. His nationality, age, and the place and date of his birth.

3. His health and his physical capacity for public service.

4. His business and employments and residences for at least the five previous years.

5. Such other information as may reasonably be required touching the applicant's merit and fitness for the public service.

What applications may be rejected.

Blank forms for such applications shall be furnished by the commission without charge to all persons requesting the same. The commission may require in connection with such application such certificates of citizens, physicians or others having knowledge of the applicant as the good of the service may require. The commission may refuse to examine the applicant, or after examination to certify an eligible, who is found to lack any of the preliminary requirements established by the commission for the examination for the position or employment for which he applies, or who is physically so disabled as to be rendered unfit for the performance of the duties of the position to which he seeks appointment, or who is addicted to the habitual use of intoxicating liquors to excess, or has been guilty of any crime or of infamous or notoriously disgraceful conduct, or who has been dismissed from the public service for delinquency or misconduct, or who has made a false statement of any material fact, or practiced, or attempted to practice, any deception or fraud in his

The Civil Service Law.

application, in his certificate, in his examination, or in securing his eligibility or appointment or refuses to furnish testimony as required in section 7 of this act. Applicants for positions in the recognized mechanical trades must have had practical experience for such periods as the commission may prescribe. Whenever the said commission refuses to examine an applicant or after an examination to certify an eligible, as provided in this section, then said commission, if requested by the person so rejected, shall give to him a full and explicit statement of the exact cause of such refusal to examine or to certify as the case may be. When any position to be filled involves fiduciary responsibility, the appointing officer, where otherwise permitted by law, may require the appointee to furnish bond or other security, and shall notify the commission of the amount and other details thereof; provided, however, that any surety company, the bonds of which are accepted by a judge of any court of record in this state, shall be a sufficient security on any such bond.

Applicants
in the me-
chanical
trades.

DIVISIONS OF CLASSIFIED SERVICE.

SECTION 12. The offices, positions and employments in the classified service of the state shall be arranged by the civil service commission in five classes to be designated as the exempt class, the competitive class, the non-competitive class, the labor class and legislative employees.

CLASSIFICATION IN PENAL AND CHARITABLE INSTITUTIONS.

SECTION 13. The superintendents or heads of the several state reformatory, charitable and penal institutions shall, within thirty days, arrange all positions connected with their respective institutions, into classified lists, conforming as near as may be to the spirit and purpose of this act, and such classifications, when approved by the state board of con-

The Civil Service Law.

Transfers
and re-in-
statements.

Emergency
of appoint-
ments.

trol, shall be adopted by the commission as the classifications in such respective institutions, and adequate eligible lists shall be made up and so far as possible at all times kept by the commission from which appointments shall be made in such institutions. But the provisions of this act with reference to removals, suspensions, discharges, reductions in pay or position, transfers and reinstatements shall not be applicable in such cases, except that they shall be made for just cause, which shall be neither religious nor political. In such institutions emergency appointments and appointments when no suitable person is on an eligible list may be made otherwise than from such list. And such persons when so appointed shall have the same rights as though taken from an eligible list, except that they may be subjected to such test as to merit and fitness as shall be prescribed by the commission.

EXEMPT CLASS.

SECTION 14. The following positions shall be included in the exempt class:

1. One deputy or assistant of each principal executive officer and the chief clerk or secretary of any board or commission.

2. One stenographer for each appointing officer, board or commission.

3. The clerks and other assistants and employees of the supreme court.

4. In addition to the above there may be included in the exempt class all other offices or positions, except laborers, for the filling of which competitive or non-competitive examinations shall be found by the civil service commission to be impracticable on account of the temporary character of the employment or for special reasons satisfactory to the commission. But no office or position shall be deemed to be in the exempt class unless it is specifically named in such class in the rules, and the reasons for such exemptions shall be stated separately in the reports of

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the said commission. Not more than one appointment shall be made to or under the title of any such office or position unless a different number is specifically mentioned in the rules. No office or position shall be classified by the commission in the exempt class except after public hearing by the commission or any member or the chief examiner thereof. Suitable public notice of such hearings shall be given by the said commission. At any such hearing any taxpayer of this state shall have the right to be heard, either in person or by counsel, either in opposition to or in favor of the proposed exemption. Appointments in the exempt class may be made without examination.

COMPETITIVE CLASS.

SECTION 15. The competitive class shall include all positions for which it is practicable to determine the merit and fitness of applicants by competitive examinations, and shall include all positions and employments now existing or hereafter created, of whatever functions, designations or compensation, in each and every branch of the classified service, except such positions as are in the exempt class, the non-competitive class, or the labor class. Appointments shall be made to or employment shall be given in all positions in the competitive class that are not filled by promotion, reinstatement, transfer or reduction under the provisions of this act and the rules made in pursuance thereof, by appointment from among those certified to the appointing officer in accordance with the provisions of section 16 of this act. The term of eligibility of an applicant shall be fixed for each list by the civil service commission at not less than one nor more than three years. Appointments shall be made from the eligible list most nearly appropriate, and a new and separate list shall be created for a stated position only when there is no appropriate list existing from which appointment may be made. No person shall be appointed or employed under any title not appro-

Appoint-
ments.Term of el-
igibility.

The Civil Service Law.

priate to the duties performed, and no person shall be transferred to, or assigned to perform the duties of, any position subject to a competitive examination, unless he shall have previously passed an open competitive examination equivalent to that required for such position.

APPOINTMENTS IN COMPETITIVE CLASS.

SECTION 16. Notice shall be given in writing by the appointing officer to the civil service commission of the existence of any vacancy or vacancies in any office or employment in the competitive class under the provisions of this act, and within ten days after the receipt of such notice the commission shall certify from the register of eligibles appropriate for the group in which the position to be filled is classified, the three names at the head thereof which have not been certified three times to the department or office in which the vacancy exists. Whenever eligibles are certified, they must always be those candidates who have been graded highest in an examination held in pursuance of this act and the rules made in accordance therewith, except that where practicable, other conditions being equal, the rules shall provide for a preference in favor of veterans of the late civil war. In every case after a name has been certified three times, it may be dropped from the list by the commission, but certificates for temporary appointment shall not be counted as one of such certifications. It shall be the duty of the appointing officer to appoint on probation with sole reference to merit and fitness one of the said candidates whose name shall have been certified in the manner above set forth to fill such vacancy then existing in the office or employment aforesaid; unless objection shall be made and sustained by the commission to one or more of the persons certified for any of the reasons stated in section 11 of this act; provided, however, that the provisions of this section may be altered by the commission when the office or employment comes

Notice of vacancy.

Certification of eligibles.

When eligibles may be dropped from the register.

The Civil Service Law.

within those where by section 17 of this act competitive examinations are not required. The commission shall make rules for the procedure in such cases.

TEMPORARY AND EXCEPTIONAL APPOINTMENTS.

SECTION 17. Positions in the competitive class may be filled without competition only as follows:

1. Whenever there are urgent reasons for filling a vacancy in any position in the competitive class and the commission is unable to certify to the appointing officer upon requisition by the latter a list of persons eligible for appointment after a competitive examination, the appointing officer may nominate a person to the commission for non-competitive examination, and if such nominee shall be certified by the said commission as qualified after such non-competitive examination, he may be appointed provisionally to fill such vacancy until a selection and appointment can be made after competitive examination, but such provisional appointment shall not continue for a longer period than two months, nor shall successive temporary appointments be made to the same position under this provision. In case of an emergency an appointment may be made without regard to the rules of this statute, but in no case to continue longer than ten days, and in no case shall successive emergency appointments be made.

Non-competitive examination in case there is no eligible list.

Provisional appointment

Emergency appointments.

2. In case of vacancy in a position in the competitive class where peculiar and exceptional qualifications of a scientific, professional, or educational character are required, and upon satisfactory evidence that for specified reasons competition in such special case is impracticable, and that the position can best be filled by the selection of some designated person of high and recognized attainments in such qualities, the commission may suspend the provisions of the statute requiring competition in such case, but no suspension shall be general in its application to such place, and all such cases of suspension shall be reported in the annual report of the commission with the reasons for the same.

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3. Where the services to be rendered by an appointee are for a temporary period not to exceed one month, and the need of such service is important and urgent, the appointing officer may select for such temporary service any person on the proper list of those eligible for the permanent appointment without regard to his standing on such list. Successive temporary appointments to the same position shall not be made under this provision. The acceptance or refusal by an eligible of a temporary appointment shall not affect his standing on the register for permanent employment, nor shall the period of temporary service be counted as a part of the probationary service in case of subsequent appointment to a permanent position.

PROMOTIONS.

SECTION 18. Vacancies in positions in the competitive class shall be filled, so far as practicable, by promotions from among persons holding positions in a lower grade in the department, office, or institution in which the vacancy exists, under rules and regulations made and enforced by the civil service commission. Promotions shall be based upon merit and fitness to be ascertained by examinations to be provided by the commission and upon the superior qualifications of the person promoted as shown by his previous service, due weight being given to seniority and experience. The commission may prescribe forms and rules for reports to be made by the proper officer on the efficiency of their subordinates and employees. For the purposes of this section an increase in the salary or other compensation of any person holding an office or position within the scope of the rules in force hereunder, beyond the limit fixed for the grade in which such office or position is classified, shall be deemed a promotion. No promotion shall be made to a position in the competitive class from a position in another class, except that persons holding positions in the labor class may be

Reports of
appointing
officers on ef-
ficiency of
subordinates

Original en-
trance qual-
ifications re-
quired.

The Civil Service Law.

promoted to positions in the lowest grade of the competitive class upon examination as provided above, when such examination is specifically authorized by the commission. No person shall be promoted to a position for original entrance to which there is required by this act or the rules adopted pursuant thereto, an examination involving essential tests or qualifications different from or higher than those required for original entrance to the positions held by such persons, except as provided above.

TRANSFERS, REINSTATEMENTS.

SECTION 19. No transfer or reinstatement shall be made for a position in one class to a position in another class unless the same be specifically authorized by the civil service commission. Section 18 and the rules adopted thereunder shall be read with this section and the rules adopted hereunder, and where the transfer involves a promotion the requirements of the promotion rule and regulation shall be observed. No transfer shall be authorized by the civil service commission of any person holding a position in the exempt class or in the non-competitive class or the labor class, to a position in the competitive class unless the person seeking to be transferred shall have served at least three years in the position from the which he desires transfer, and unless the position to which he desires transfer is similar in the duties to be performed to the position from which he desires transfer. No such transfer shall be authorized unless the person so wishing to be transferred has attained a place upon the appropriate eligible list in force at the time the request for the transfer is made. Any person who has held a position by appointment under the civil service rules and who has been separated from the service without any delinquency or misconduct on his part but owing to reasons of economy or otherwise, may be reinstated within one year from the date of such separation to the same or similar position in the same department, provided, that for the original entrance to the posi-

Transfers.

Restrictions

Reinstatements.

Qualifica-
tions.

tion proposed to be filled by such reinstatement there is not required in the opinion of the civil service commission examination involving essential tests or qualifications different from or higher than those involved in the examination for the original entrance to the position formerly held by the person proposed to be reinstated.

NON-COMPETITIVE CLASS.

SECTION 20. The non-competitive class shall include such positions as are not in the exempt class or the labor class, and which it is impracticable to include in the competitive class. Appointments to positions in the non-competitive class shall be made after such non-competitive examination as is prescribed by the rules of the commission. The commission shall state in its annual report the number of persons who come within this class, and the character of their services.

LABOR CLASS.

Local regis-
tration.

Examination

SECTION 21. The labor class shall include ordinary unskilled laborers. Vacancies in the labor class shall be filled by appointment from lists of applicants registered in their respective localities by the civil service commission according to rules and regulations determined by said commission except in cases of temporary employment. There may be separate lists of applicants for different kinds of labor or employments and the commission may establish separate labor lists for various localities, institutions and departments. Where the labor service of any institution or department extends to separate localities the commission may provide separate registration lists for each district or locality. The commission shall require an applicant for registration for the labor service before he can be registered to furnish such evidence or to pass such examination as they may deem proper with respect to his age, residence, physical condition, ability to labor, sobriety, industry, capacity and experience in the employment for which he applies.

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REMOVALS, SUSPENSIONS AND REDUCTIONS.

SECTION 22. No subordinate or employee in the competitive class, non-competitive class, or the labor class of the civil service of the state, who shall have been appointed under the provisions of this act or the rules made pursuant thereto, shall be removed, suspended for more than fifteen days, discharged, or reduced in pay or position, except for just cause, which shall not be religious or political. In all cases of removal the appointing officer shall, at the time of such action, furnish to the subordinate his reasons for the same and allow him a reasonable time in which to make an explanation. The reasons for removal and the answer thereto shall be filed in writing with the commission.

ROSTER OF CLASSIFIED SERVICE.

SECTION 23. No person shall be appointed to or employed in any position in the classified service for which rules have been prescribed pursuant to the provisions of this act, until he has passed an examination or is shown to be specially exempted from such examination in conformity with the provisions of this act and of the rules made pursuant thereto. It shall be the duty of each appointing officer of this state to report to the civil service commission forthwith in writing upon such appointment or employment, the name of such appointee, or employee, the title and character of his office or employment, whether on probation or absolute appointment, the date of commencement of service by virtue thereof, and the salary or compensation thereof, and to report from time to time, and, upon the date of the official action, in, or knowledge of each case, any separation of a person from the service or any promotion, reduction, transfer, reinstatement, or other change therein, and such other information as the civil service commission may require in order to keep the roster hereinafter mentioned. The civil service commission shall keep in its office an official roster of

Duty of appointing officers to report to commission.

Roster.

The Civil Service Law.

the classified civil service of this state and shall enter thereon the name of each and every person who has been appointed to, employed, promoted, reduced or reinstated in any position in such service, upon such evidence as it may require or deem satisfactory that such person was appointed to, employed, promoted, reduced, or reinstated in the service in conformity with the provisions of this act and the rules adopted pursuant thereto. This roster shall be open to public inspection at all reasonable hours. The roster shall show in connection with each name the date of appointment, employment, promotion, reduction or reinstatement, the compensation of the position, the title of the position, and the nature of the duties thereof, and the date and cause of any termination of such office or employment. The commission shall have access to all public records and papers, the examination of which will aid in the discharge of its duty in connection with said roster.

Publicity.

CERTIFICATION OF PAY-ROLLS.

SECTION 24. It shall be unlawful for the secretary of state, or other fiscal officer of this state to draw, sign, or issue, or to authorize the drawing, signing or issuing of any warrant on the treasurer or other disbursing officer of the state, or for the treasurer or other disbursing officer of the state to pay any salary or compensation to any officer, clerk, employee, or other person in the classified service of the state, unless an estimate, payroll or account for such salary or compensation containing the names of every person to be paid, shall bear the certificate of the civil service commission that the persons named in such estimate, payroll, or account have been appointed, employed, reinstated or promoted in pursuance of this act. Any officer, clerk, employee, or other person entitled to be certified by said commission to the secretary of state or other fiscal or disbursing officer of the state, as having been appointed or employed in pursuance of law and of the rules made in pursuance of law, and refused such certifi-

Restrictions
of secretary
of state and
the state
treasurer.

Mandamus
to compel
certification.

The Civil Service Law.

cate, may maintain a proceeding by mandamus to compel such commission to issue such certificate. Any sums paid contrary to the provision of this section may be recovered from any officer or officers making such appointments in contravention of the provisions of law or of the rules made in pursuance of law or from any officer signing or countersigning or authorizing the signing or countersigning of any warrant for the payment of the same or from the sureties on the official bond of any of said officers, in an action in the circuit court of any county within the state, maintained by the civil service commission or of any member thereof, or by a citizen resident therein, who is assessed for, and liable to pay, or within one year before the commencement of the action has paid, a state, city, or county tax within this state. All moneys recovered in any action brought under this section must, when collected be paid into the treasury of the state or of the proper city or county thereof, except that such citizen being plaintiff in any such action shall be entitled to receive for his own use the taxable costs of such action and five per cent of the amount recovered as attorney's fees.

Action to recover unlawful payments of salary.

RECOMMENDATIONS.

SECTION 25. No recommendation for any person who shall apply for office or place, or for examination or registration under the provisions of this act, or of the rules established pursuant thereto, except as to character, and, in the case of former employees, as to ability, shall be given to, or considered by any person concerned in making any examination, registration, appointment, promotion, or reinstatement under this act, and the rules made pursuant thereto. No recommendation whatsoever shall relate to the political or religious opinions of any applicant. No recommendation for the promotion of any person in the classified service shall be considered by any officer concerned in making promotions except it be made by the officer or officers under whose super-

The Civil Service Law.

vision or control such employee is serving. Any recommendations made contrary to the provisions of this section with the knowledge and consent of the applicant or employee shall be sufficient cause for refusing his application or appointment, or for debarring him from the promotion proposed, and a repetition of the offense shall be sufficient cause for removing him from the service.

POLITICAL AND RELIGIOUS AFFILIATIONS.

SECTION 26. No question in any form of application or in any examination shall be so framed as to elicit information concerning the political or religious opinions or affiliations of any applicant, nor shall any inquiry be made concerning such opinions or affiliations and all disclosures thereof shall be discountenanced. No discriminations shall be exercised, threatened, or promised, by any person in the civil service against or in favor of any applicant, eligible, or employee in the classified service because of his political or religious opinions or affiliations.

MISDEMEANOR TO OBSTRUCT RIGHT OF EXAMINATION.

SECTION 27. Any commissioner, or examiner, or any other person who shall willfully by himself or in co-operation with one or more persons, defeat, deceive or obstruct any person in respect of his or her right of examination or registration, according to this act, or to any rules or regulations prescribed pursuant thereto, or who shall willfully or corruptly, falsely mark, grade, estimate or report upon the examination or proper standing of any person examined, registered or certified, pursuant to the provisions of this act, or aid in so doing, or who shall willfully or corruptly make any false representations concerning the same, or concerning the person examined, or who shall willfully or corruptly furnish any person any special or secret information for the purpose of either improving or injuring the prospects or chances of any persons so examined, registered or

False representations.

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certified, being appointed, employed or promoted, or who shall personate any other person, or permit or aid in any manner any other person to personate him or her, in connection with any examination, or registration or application or request to be examined or registered, shall for each offense be deemed guilty of ^{False personation in examination} a misdemeanor.

POLITICAL ASSESSMENTS.

SECTION 28. No officer, agent, clerk or employe under the government of the state shall, directly or indirectly solicit or receive, or be in any manner concerned in soliciting or receiving, any assessment, subscription or contribution, or political service, whether voluntary or involuntary, for any political purpose whatever, from any officer, agent, clerk or employe of the state. Every said officer, agent, clerk or employee who may have charge or control in any building, office, or room occupied for any purpose of said government is hereby authorized to prohibit the entry of any person, and he shall not permit any person to enter the same for the purpose of therein making, collecting, receiving or giving notice, of any political assessment, subscription or contribution, and no person shall enter, or remain in any said office, building, or room, or send or direct any letter or other notice thereto, for the purpose of giving notice of, demanding, or collecting a political assessment, subscription or contribution, nor shall any person therein give notice of, demand, collect or receive, any such assessment, subscription or contribution. Any person who shall be guilty of violating any provision of this section shall be guilty of a ^{Misdemeanor.} misdemeanor.

OFFICIAL INFLUENCE.

SECTION 29. Whoever, while holding any public office, or in nomination for, or while seeking a nomination or appointment for, any public office, shall use or promise to use, whether directly or indirectly,

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any official authority or influence (whether then possessed or merely anticipated) in the way of conferring upon any person, or in order to secure or aid any person in securing any office or public employment or public contract or any nomination, confirmation, promotion, or increase in salary, upon a consideration or condition that the vote or political influence or action of the last named person or any other, shall be given or used in behalf of any candidate, officer or party, or upon any other corrupt condition or consideration, shall be deemed guilty of bribery, or an attempt at bribery as the case may be. And whoever, being a public officer or having or claiming to have, authority or influence for or affecting the nomination, public employment, confirmation, promotion, removal, increase or decrease of salary, or position of any public officer, shall use, or promise or threaten to use, any such authority or influence, directly or indirectly, in order to coerce or persuade the vote or political action of any citizen, or the removal, discharge or promotion of any officer or public employee, or upon any other corrupt consideration, shall also be guilty of bribery or of an attempt at bribery as the case may be. Every person found guilty of such bribery or of an attempt to commit the same as aforesaid, shall, upon conviction thereof, be

Corrupt use of official influence deemed bribery.

Penalty. liable to be punished by a fine of not less than one hundred dollars nor more than three thousand dollars, or to be imprisoned not less than ten days nor more than two years, or to both said fine and imprisonment in the discretion of the court. The phrase

Public officer defined. "public officer" shall be held to include all public officials in this state, whether paid directly or indirectly from the public treasury of the state, or by fees or otherwise, and the phrase "public employee" shall be held to include every person not being an officer who is paid from said treasury of the state.

Public employee defined.

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VIOLATION OF RULES A MISDEMEANOR.

SECTION 30. Whoever, after a rule has been duly established and published, according to the provisions of this act, makes an appointment to office or selects a person for employment contrary to the provisions of such rule, or wilfully refuses or neglects otherwise to comply with, or to conform to, the provisions of this act, or violates any of such provisions shall be deemed guilty of a misdemeanor. If any person shall be convicted under this section, any public office which such person may hold shall by force of such conviction be rendered vacant, and such person shall be incapable of holding office for the period of five years from the date of such conviction.

PENALTIES FOR MISDEMEANORS UNDER THIS ACT.

SECTION 31. Misdemeanors under the provisions of this act shall be punishable by a fine of not less than fifty dollars nor more than one thousand dollars, or by imprisonment for a term not exceeding two years or by both such fine and imprisonment in the discretion of the court.

TAX PAYERS' RIGHT OF ACTION.

SECTION 32. The right of any tax payer to bring an action to restrain the payment of compensation to any person appointed to or holding any office or place of employment in violation of the provisions of this act, shall not be limited or denied by reason of the fact that said office, or place of employment shall have been classified, as, or determined to be, not subject to competitive examination; provided, however, that any judgment or injunction granted or made in any such action shall be prospective only, and shall not affect payments already made or due to such persons by the proper disbursing officers, in accordance with the civil service rules in force at the times of such payments.

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REPEALS.

SECTION 33. All acts and parts of acts inconsistent with this act are hereby repealed.

ENABLING CLAUSE.

SECTION 34. This act shall take effect and be in force from and after its passage and publication.

Approved June 14, 1905.

PART VII.



Rules of the Civil Service Commission.

THE CIVIL SERVICE RULES.

In accordance with the provisions of chapter 363, of the laws of 1905, the following rules have been prepared for the regulation of the classified civil service of the state of Wisconsin:

CLASSIFICATION.

RULE I.

NOTE: Inasmuch as the law is very comprehensive and detailed in its provisions, it has been found necessary for the guidance of the reader to reprint many of its more specific provisions in connection with the rules under the heading to which they refer. The rules prepared by the Commission are numbered. The provisions of the law are designated by letters of the alphabet.

a. The civil service shall be divided into the unclassified service and the classified service. (From section 8.)

b. The unclassified service shall comprise: All officers elected by the people. All officers and employees appointed by the governor whether subject to confirmation or not. All officers and employees in any department for the creation of which a vote of two-thirds of all the members elected to each house is required. All presidents, deans, principals, professors, instructors, scientific staff and other teachers in the University, normal or public schools, the library staff in any library maintained wholly or in part at state expense, the superintendent, warden or other head of the state reformatory, charitable and penal institutions. All persons appointed by name in any statute. All legislative officers. (From section 8.)

c. The classified service shall comprise all positions not included in the unclassified service. (From section 8.)

d. The offices, positions and employments in the classified service of the state shall be arranged by the civil service commission in five classes to be designated as the exempt class, the competitive class, the non-competitive class, the labor class and legislative employees. (From section 12.)

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CLASSIFIED SERVICE.

RULE II.

Exempt Class.

a. Appointments in the exempt class may be made without examination. (From section 14.)

b. The following positions shall be included in the exempt class:

One deputy or assistant of each principal executive officer and the chief clerk or secretary of any board or commission.

One stenographer for each appointing officer, board or commission.

The clerks and other assistants and employees of the supreme court. (From section 14.)

1. The commission may classify as exempt any position in the competitive or non-competitive classes for reasons stated in section 14 of the law.. A public hearing shall be granted for placing any such position in the exempt class upon the formal request of the proper appointing officer.

2. Notice of such hearings shall be published at least ten days in advance in one issue of at least one daily newspaper in each of the four largest cities in the state and posted on the bulletin board in the office of the commission for the same period prior to a public hearing.

c. At any such hearing any tax-payer of this state shall have the right to be heard, either in person or by counsel, either in opposition to or in favor of the proposed exemption. (From section 14.)

SECTION 3. In accordance with the provisions of Section 14, the following positions are hereby placed in the exempt class:

In the Office of the State Board of Assessment:

All persons appointed to act as special assessors and special members of boards of review under Chapter 259, Laws of 1905, and all persons appointed to act as assistants or special assistants for the review and redetermination of the property in a county on appeal from the action of county board under Chapter 474, Laws of 1905, for a period of not to exceed one year from the date of the adoption of this rule.

In the State University:

The registrar of the University, one position.

In the Office of the State Superintendent of Public Instruction:

The members of the Board of Examiners for state teachers' certificates, three positions.

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In the State Geological and Natural History Survey:
All members of the scientific staff.

In the State Penal and Charitable Institutions:
The chaplain.

In the Department of the State Dairy and Food Commission:
Special counsel as provided for in Section 1410a, Statutes of 1898, as amended by Chapter 193, Laws of 1905, and expert agents for the inspection of cheese factories and creameries, when no cost for compensation or traveling expenses shall thereby be incurred by the Dairy and Food Commissioner. (Approved March 23, 1906.)

SECTION 4. Bona fide students employed in the state normal schools for occasional, temporary or intermittent service at a compensation of not to exceed \$15.00 for any one month during the school year or of \$30.00 for any one month during vacation periods are hereby placed in the exempt class. (Adopted Sept. 12, 1906.)

SECTION 5. Bona fide students employed in the University for a temporary, occasional or intermittent service at a compensation of not to exceed \$25.00 during any month while the University is in session or of \$40.00 during vacation time, are hereby placed in the exempt class. (Adopted Sept. 12, 1906.)

RULE III.

Competitive Class.

a. The competitive class shall include all positions for which it is practicable to determine the merit and fitness of applicants by competitive examinations, and shall include all positions and employments now existing or hereafter created, of whatever functions, designations or compensation, in each and every branch of the classified service, except such positions as are in the exempt class, the non-competitive class, or the labor class. (From section 15.)

1. All positions in the competitive class shall be arranged in accordance with the following classification:

GROUPS BASED UPON THE CHARACTER OF THE SERVICE
RENDERED.

Group A. Clerks, which term shall include all positions, the duties of which are of a clerical character, and which are not otherwise specifically provided for herein.

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- Subdivision 1. Secretaries, chief clerks.
2. Clerks, recorders, registers, copyists.
3. Clerks with special educational requirements.
4. Bookkeepers, accountants.
5. Stenographers and typewriters.
6. Pages, office boys and girls.

Group B. Cashiers, which term shall include all positions, the duties of which are the actual receipt, custody or disbursement of money or the enforcement of the accountability for the same.

Group C. Custodians and messengers, which term shall include all positions the duties of which are the charge of property or persons, or as attendants.

- Subdivision 1. Stewards who are not disbursing agents, superintendents of buildings.
2. Matrons.
3. Storekeepers.
4. Prison and reformatory keepers and guards.
5. Officers, attendants, nurses, etc., having care of inmates of institutions and hospitals.
6. Protectors of forest fisheries and game.
7. Messengers, attendants and watchmen.
8. Janitors.

Group D. Engineers, which term shall include all positions where qualifications of an engineering or cognate character are required.

- Subdivision 1. Civil engineers.
2. Levelers, surveyors, rodmen.
3. Chainmen.
4. Architects.
5. Architectural draftsmen.
6. Engineering draftsmen.
7. Chief engineers.
8. Electrical engineers, dynamo tenders, electricians.
9. Steam engineers, firemen, engine drivers.

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Group E. Inspectors, which term shall include all positions the duties of which are the inspection of materials or workmanship or the supervision of laborers.

- Subdivision 1. Superintendents of construction or repairs when not civil engineers or architects.
2. Inspectors of masonry, iron work and other materials and workmanship.
 3. Electrical inspectors.
 4. Overseers, foremen.

Group F. Special agents, which term shall include all positions requiring investigative and detective ability.

- Subdivision 1. Examiners for the insurance department.
2. Examiners for state officers, boards and commissions.
 3. Deputy factory inspectors.
 4. Inspectors of foods.
 5. Inspectors in the educational department.
 6. Agents for state institutions.
 7. Oil inspectors.

Group G. Law positions, which term shall include all positions requiring some legal knowledge.

- Subdivision 1. Law clerks, brief clerks, statutory revision clerks, clerks in other offices whose duties require some legal knowledge.
2. Corporation examiners and clerks.

Group H. Medical positions, which term shall include all positions requiring medical or pharmaceutic knowledge.

- Subdivision 1. Physicians, surgeons.
2. Medical examiners.
 3. Medical internes.
 4. Health officers.
 5. Sanitary experts and inspectors.
 6. Pharmacists, apothecaries.
 7. Veterinarians.

Group I. Mathematicians, which term shall include all positions requiring special mathematical qualifications.

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- Subdivision 1. Actuaries, statisticians, computers.
2. Expert accountants.

Group J. Scientists, which term shall include all positions requiring special scientific knowledge.

Group K. Agriculturists, which term shall include all positions requiring agricultural or horticultural knowledge, including arboriculture and the breeding and care of domestic animals.

- Subdivision 1. Agriculturists, farmers.
2. Horticulturists, gardeners, arboriculturists.

Group L. Instructors, which term shall include all positions, the duties of which are scholastic instruction or to educate or test the ability to instruct.

- Subdivision 1. Principals of schools.
2. Teachers in all branches, other than such as are otherwise specially provided for in this classification.
3. Examiners of educational and scholastic qualifications.

Group M. Mechanics and craftsmen, which term shall include all positions requiring special mechanical skill, or as tradesmen, not classed as laborers.

Group N. Miscellaneous positions, which term shall include all positions requiring expert or other qualifications not embraced in the exempt or non-competitive classes, or in other groups in this class.

Group O. Unskilled laborers.

2. Classification of service in the state reformatory, charitable and penal institutions, as arranged by the superintendents or heads of the several state institutions, and approved by the State Board of Control.

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Competitive.

Supervisor of attendants.	Chief clerk.
Engineer.	Head-farmer.
Assistant engineer.	Head-gardener.
Fireman.	Head-carpenter.
Druggist.	Head-mason.
Attendants.	Head-tailor.
Bookkeeper.	Head-shoemaker.
Storekeeper.	Head-cook.
Guards.	Foreman of shop.
Institutional physician.	Teachers.

Non-competitive.

Steward.	Deputy warden.
Assistant steward.	Chaplain.
Matron.	State agents.
Family matron.	Physicians not residing in institutions.
Supervisor of boys and girls.	
Assistant superintendent.	

Labor.

Launderer.	Baker.
Barnman.	All common laborers, such as :
Teamster.	Farmers.
Seamstress.	Gardeners.
Servant.	Carpenters.
Kitchen girl.	Masons.
Watchman.	Tailors.
Barber.	Shoemakers.
Butcher.	Cooks, etc.
Painter.	

3. The omission in the above classification of any official designation or appellation of a position in the service shall not exclude such position from the classification, as it will be comprised in the group and subdivision to which it belongs by the general definition and specifications of such group and subdivision.

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4. The commission may further subdivide for the purpose of examination and promotion the positions in any group or subdivision thereof.

5. The classification of all positions shall be governed solely by the respective duties and functions of such positions, and in requesting from the commission certifications from eligible lists for selection for appointment, the heads of offices shall give in detail the duties attached to such positions, and shall name so near as may be the groups and subdivisions that comprise respectively such duties and functions.

RULE IV.

Non-competitive Class.

a. The non-competitive class shall include such positions as are not in the exempt class or in the labor class, and which it is impracticable to include in the competitive class. (From section 20.)

b. Appointments to positions in the non-competitive class shall be made after such non-competitive examination as is prescribed by the rules of the commission. The commission shall state in its annual report the number of persons who come within this class, and the character of their service. (From section 20.)

1. Non-competitive examinations for positions in the non-competitive class shall be given to persons formally nominated for examination to the commission by the proper appointing officer.

2. Applicants for non-competitive examinations shall fill out and make oath to the proper application paper, and may file such papers at any time before undergoing an examination.

3. The non-competitive examination shall conform as nearly as practicable in subject matter and marking to the competitive examination of the same grade.

SECTION 4. In accordance with the provisions of Section 20, the following positions are hereby placed in the non-competitive class:

In the Office of the Railroad Commission:

All consulting railway expert statisticians rendering occasional service to the Commission.

In the Department of the State Treasury Agent:

All deputy treasury agents whose compensation, as shown by the record of the previous year, is less than \$300. (Adopted May 24, 1906.)

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SECTION 4b. The position of Assistant State Forester is hereby placed in the non-competitive class until April 19, 1908, after which time the position shall be filled by competitive examination whenever a vacancy in the position shall occur. (Adopted April 19, 1906.)

SECTION 5. The position of State Organizer for University Extension is hereby placed in the non-competitive class until July 20, 1908, after which time the position shall be filled by competitive examination whenever a vacancy in the position shall occur.

SECTION 6. The position of Library Assistant for University Extension is placed in the non-competitive class until July 20, 1908, after which time the position shall be filled by competitive examination whenever a vacancy in the position shall occur. (Adopted July 19, 1906.)

RULE V.

Applicants.

a. The competitive examinations shall be free and open to all applicants who are citizens of the United States and of the state of Wisconsin and who have fulfilled the preliminary requirements stated in section 11 of this act, and shall be held at such times and places as shall, in the judgment of the commission, most nearly meet the convenience of applicants and the needs of the service. (From section 10.)

b. The commission may require in connection with such application such certificates of citizens, physicians, or others having knowledge of the applicant as the good of the service may require. (From section 11.)

c. The commission may refuse to examine the applicant, or after examination to certify an eligible, who is found to *lack any of the preliminary requirements established* by the commission for the examination for the position or employment for which he applies, or who is physically so disabled as to be rendered unfit for the performance of the duties of the position to which he seeks appointment, or who is addicted to the habitual use of intoxicating liquors to excess, or has been guilty of any crime or of infamous or notoriously disgraceful conduct, or who has been dismissed from the public service for delinquency or misconduct, or who has made a false statement of any material fact, or practiced, or attempted to practice, any deception or fraud in his application, in his certificate, in his examination, or in securing his eligibility or appointment, or refuses to furnish testimony as required in section VII of this act. (From section 11.)

e. Whenever the said commission refuses to examine an applicant or after an examination to certify an eligible, as provided in this sec-

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tion, then said commission, if requested by the person so rejected, shall give to him a full and explicit statement of the exact cause of such refusal to examine or to certify as the case may be. (From section 11.)

RULE VI.

Applications.

a. The civil service commission shall require persons applying for admission to any examination provided for under this act, or under the rules and regulations of the said commission, to file in its office a reasonable time prior to the proposed examination, a formal application, in which the applicant shall state under oath or affirmation:

1. His full name, residence and post office address.
2. His nationality, age and the place and date of his birth.
3. His health and his physical capacity for public service.
4. His business and employments and residences for at least the five previous years.
5. Such other information as may be reasonably required touching the applicant's merit and fitness for the public service. (From section 11.)

b. Blank forms for such applications shall be furnished by the commission without charge to all persons requesting the same. (From section 11.)

1. Whenever an application is rejected or whenever an applicant fails to pass an examination, notice of such rejection or failure to pass examination shall be mailed to the applicant.

RULE VII

Examiners.

a. The commissioners may designate persons in or out of the official service of the state or of any city or county who shall, if in the service, with the consent of the head of the department or office in which such person serves, act as local examiners. (From section IV.)

b. Such persons in the official service in the performance of such duties as the commission shall direct, shall be under the direct and sole control of the commission, and their duties shall be considered part of the duties of the office in which they are serving, and time shall be allowed therefor during office hours and no compensation shall be paid such officers for such service. (From section IV.)

1. In preparing examinations of a technical or special character, or where the requirements are peculiarly within the knowledge of the department in which appointment is to be

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made, the chief examiner shall in his discretion consult with the incumbent of such office or with the head of such institution or department or with such other persons as may have knowledge and experience in matters pertaining to the examination and shall use his judgment in selecting questions from the lists submitted by them.

RULE VIII.

Local Examiners.

1. The civil service commission shall appoint one local examining board for each assembly district and where an assembly district comprises more than one county, one local examining board for each county.

2. The local board shall be non-partisan in character and shall consist of three persons residing in the district.

3. The commission shall appoint one member of the local examining board as supervising examiner, whose duty it shall be to be present at the time and place designated by the commission for holding an examination and to take charge of the examination. The supervising examiner shall also act as secretary.

4. Upon receiving notice of appointment the local examining board shall, subject to the call of the supervising examiner, meet and elect a president. It may suggest to the chief examiner at Madison suitable accommodations for holding examinations and upon request furnish applicants with application blanks and distribute such printed rules, regulations and information as may be furnished by the commission. All members of the local examining board shall, so far as possible, be present at all examinations and shall assist in enforcing the rules and regulations of the commission governing examinations and take such measures as may be necessary to insure fairness.

5. In case of the temporary disability of the supervising examiner, the local board may designate some other member to take charge of the examination and may procure such outside assistance as may be deemed necessary.

6. No person shall be admitted to examination who does not present an admission card issued to him by the state civil service commission.

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7. The local examiners may receive applications for positions in the labor class and, except where otherwise ordered, shall immediately forward them to the chief examiner at Madison.

8. Local examiners shall not incur expense in connection with examinations beyond necessary stationery, postage and supplies, except at the direction of the commission or of the chief examiner.

RULE IX.

Examinations.

a. All examinations for positions in the classified service shall be practical in character and shall relate to those matters which will fairly test the capacity and fitness of the persons examined to discharge the duties of the office or employment sought by them, giving due allowance for experience in the same or similar positions. (From section 10.)

b. Examinations shall be held at such times and places as shall, in the judgment of the commission, most nearly meet the convenience of applicants and the needs of the service. (From section 10.)

c. Examinations shall be held simultaneously at a convenient point in each of the assembly districts in the state, and in the case of assembly district embracing more than one county, at each of the county seats therein. (From section 10.)

d. No question in any form of application or in any examination shall be so framed as to elicit information concerning the political or religious opinions or affiliations of any applicant, nor shall any inquiry be made concerning such opinions or affiliations, and all disclosures thereof shall be discountenanced. No discriminations shall be exercised, threatened or promised, by any person in the civil service against or in favor of any applicant, eligible, or employee in the classified service because of his political or religious opinions or affiliations. (From section 26.)

1. The minimum percentage of proficiency for eligibility in any subjects assigned for examinations and the average percentage for proficiency in all subjects, shall be fixed by the commission for each class or grade and shall be published prior to holding examinations.

2. Wherever in a general competitive examination it is, in the judgment of the commission, deemed necessary, a preliminary or supplementary or special examination may be required of eligibles and such examination may be held at the time and place indicated by the commission.

3. The commission shall determine and make public relative weights of subjects included in the examination in each sep-

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arate class of service, and proficiency in any subject shall be credited in grading the standing of the person examined, in proportion to the value of a knowledge of such subject in the branch or part of the service which the applicant seeks to enter.

4. In the absence of any regulations to the contrary non-competitive examinations shall be conducted by the chief examiner or his authorized deputy, and the papers shall be marked by him with the assistance of such persons as he may select.

5. The commission may authorize as an element in any non-competitive or special examination, an oral examination, particularly where administrative functions, scientific or technical knowledge, or manual skill are required. But all oral examinations shall be under the immediate direction of the chief examiner or his authorized deputy, and a record of such examination shall be preserved.

6. Upon the request of any officer or board having the power of appointment to any office or position in the service of the state to which these rules do not apply, the commission will, whenever practicable, hold competitive or non-competitive examinations for such office or position.

RULE X.

Eligible List.

a. The term of eligibility of an applicant shall be fixed for each list by the civil service commission at not less than one nor more than three years. (From section 15.)

1. The period of eligibility for all positions shall be one year. But the commission may in its discretion extend the period of eligibility for any position or group.

2. The names of eligibles shall be entered in the order of their average percentages, on the proper register of eligibles.

3. Appointment shall be made from the eligible list most nearly appropriate for the group in which the position to be filled is classified, and a new list shall be created for a stated position or group of positions only when there is no appropriate list existing or when the existing list from which certification is to be made is likely to be exhausted.

4. Whenever there remain on the register the names of any eligibles for any position at the time when the names of eligi-

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bles, ascertained by a new examination, are to be entered thereon the names of all the eligibles shall be registered subject to the provisions of section 3, Rule X.

5. When two or more eligibles on a register have the same average percentage, preference in certification shall be determined by the order in which their applications were filed, but neither priority in the date of application nor of examination will give any other advantage in position on the register of eligibles.

6. Whenever the commission is notified that proficiency in a special subject is needed in the position to be filled, it may, upon request of the appointing officer, take steps to ascertain the names of all those on the list who possess such qualifications and shall certify them in their order or shall in its discretion conduct a new examination.

7. In accordance with the provisions of section XVI of the law, adequate eligible lists shall be made up, and so far as possible at all times kept by the commission, from which appointments shall be made for service in the several state charitable and penal institutions.

8. In accordance with the provisions of section XVI of the law, any veteran of the late civil war who has attained the required percentage for eligibility shall be given such preference in registration as the addition of five per cent to his average standing would entitle him to.

RULE XI.

Certification and Appointment.

1. Upon requisition from an appointing officer to fill a vacancy in the competitive class, the commission shall, in accordance with the provisions of section XVI, certify the three names standing highest in the appropriate eligible list giving preference in such certification to veterans of the late civil war.

2. In case objection is made by the appointing officer to any of the persons certified for reasons stated in section XI of the law, the commission may investigate the charges and if the objection is sustained substitute other names from the eligible list. In case objection is not sustained, the appointing officer shall select one of the candidates on probation in accordance with the provisions of section XVI of the law.

3. In certifying from the eligible list for deputy game wardens, oil inspectors and deputy treasury agents, where the service is confined to a locality, the secretary of the commission shall upon request of the appointing officer, give preference in certification in their order of eligibility to the person or persons residing in the district in which the service is required.

a. All original appointments to the competitive and non-competitive classes, and the labor class of the classified service shall be for a probationary period of one, two or three months in the discretion of the appointing offices, but dismissal for cause may be made during such period. (From section IX.)

4. In accordance with section 9 of the law the appointing officer shall, when giving notice of appointment, state the length of the probationary period established by him for such appointment.

b. If at the close of this probationary term the conduct or capacity of the probationer has not been satisfactory to the appointing officer, the probationer shall be notified in writing that he will not receive absolute appointment; otherwise his retention in the service shall be equivalent to his final and absolute appointment. (From section IX.)

c. In every case after a name has been certified three times, it may be dropped from the list by the commission, but certificates for temporary appointment shall not be counted as one of such certifications. (From section XVI.)

5. When an eligible certified for appointment shall fail to accept an offer of appointment by mail within six business days next succeeding the mailing of notice of appointment, or shall fail to accept an appointment within the same or next succeeding business day when notification is sent by telegram, he shall be deemed to have declined the appointment, and if, after having accepted an appointment by mail or telegram, he fails to present himself for duty within ten days from the date the notice is mailed, he shall, unless the time is extended by the appointing officer, be deemed to have declined the appointment.

6. In case an eligible certified for appointment on probation shall decline appointment, his name shall be stricken from the list and shall only be restored to said list in the discretion of the commission upon his written request stating his reasons for such declination. If the declination is on account of the locality of the position offered, or on account of salary, the eligible shall not be again certified for the same locality or for the same or less salary.

7. Whenever the sex of those whose names are to be certified

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is fixed by any law, rule or regulation, or is specified in the request for certification, the names of those of the sex so fixed or specified shall be certified.

RULE XII.

Temporary and Exceptional Appointments.

a. Positions in the competitive class may be filled without competition only as follows:

Whenever there are urgent reasons for filling a vacancy in any position in the competitive class and the commission is unable to certify to the appointing officer upon requisition by the latter a list of persons eligible for appointment after a competitive examination, the appointing officer may nominate a person to the commission for non-competitive examination, and if such nominee shall be certified by the said commission as qualified after such non-competitive examination, he may be appointed provisionally to fill such vacancy until a selection and appointment can be made after competitive examination, but such provisional appointment shall not continue for a longer period than two months, nor shall successive temporary appointments be made to the same position under this provision. (From section VII.)

b. In case of an emergency an appointment may be made without regard to the rules of this statute, but in no case to continue longer than ten days, and in no case shall successive emergency appointments be made. (From section XVIII.)

c. In case of vacancy in a position in the competitive class where peculiar and exceptional qualifications of a scientific, professional or educational character are required, and upon satisfactory evidence that for specified reasons competition in such special case is impracticable, and that the position can best be filled by the selection of some designated person of high and recognized attainments in such qualities, the commission may suspend the provisions of the statute requiring competition in such case, but no suspension shall be general in its application to such place, and all such cases of suspension shall be reported in the annual report of the commission with the reasons for the same. (From section XVII.)

d. Where the services to be rendered by an appointee are for a temporary period not to exceed one month, and the need of such service is important and urgent, the appointing officer may select for such temporary service any person on the proper list of those eligible for the permanent appointment without regard to his standing on such list. Successive temporary appointments to the same position shall not be made under this provision. (From section XVII.)

The acceptance or refusal of an eligible of a temporary appointment shall not affect his standing on the register for permanent employment, nor shall the period of temporary service be counted as a part of the probationary service in case of subsequent appointment to a permanent position. (From section XVII.)

RULE XIII.

Reinstatements.

a. Any person who has held a position by appointment under the civil service rules and who has been separated from the service without any delinquency or misconduct on his part but owing to reasons of economy or otherwise, may be reinstated within one year from the date of such separation to the same or similar position in the same department, provided, that for the original entrance to the position proposed to be filled by such reinstatement there is not required in the opinion of the civil service commission examination involving tests or qualifications different from or higher than those involved in the examination for the original entrance to the position formerly held by the person proposed to be reinstated. (From section XIX.)

1. The names of all persons who have held positions in the competitive class by appointment under the civil service rules, and who have been separated from the service through no delinquency or misconduct on their part, and who at the time of such separation shall have been recommended by the appointing officer for preference, shall be entered upon lists of suspended employees and shall remain thereon for a period of one year, and, upon notice of a vacancy in the same or similar position in any department, names from such lists of suspended employees shall be certified in preference to names from the eligible list.

RULE XIV.

Transfers.

1. Upon request of the head of the department affected, a person who has received an appointment in accordance with the civil service law and rules, to a position in the competitive class and who has served the required probationary term, may be transferred to a position similar in character in the same group and subdivision upon certification by the commission.

RULE XV.

Promotions.

1. A change in rank or grade shall constitute promotion. A material change in duties and in responsibilities shall be deemed a change in rank, and an increase in salary, beyond the limits fixed for the grade by clause 7 of this rule, shall be deemed a change in grade.

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2. Whenever there is a vacancy in a position in a department above the lowest rank or grade, the commission shall ascertain whether there are at least three persons who have served three months or more in a lower rank or grade, eligible and willing to compete to fill the vacancy; and in case it is found that there are at least three such persons, the vacancy shall be filled from the eligible list resulting from a competitive examination for promotion; in which examination the elements to be considered shall be, 1, the competitive mental examination, and 2, the records of efficiency, character, conduct and seniority.

3. Whenever there are less than three persons in the next lower rank or grade, eligible and willing to compete, the commission shall hold an original competitive examination to fill the vacancy or may permit the appointing officer to nominate one of such eligible persons, who may be promoted upon passing the required non-competitive examination.

4. If the vacancy is in a position in the higher ranks or grades, the commission may, if it deems that on account of the executive ability required to fill the position, promotion by competitive examination is impracticable and not for the best interests of the service, hold an original competitive examination without regard to the number of persons in the next lower rank or grade.

5. The commission shall in each case determine what persons are eligible to compete for promotion from a consideration of the duties to be filled and the duties which the persons seeking the promotion perform.

6. In case the records of efficiency, character and conduct have not been regularly and properly kept and filed, the commission shall refuse to hold promotion examinations until proper records are received, or shall disregard records as an element in the examination.

7. The grades for all departments shall be the following:

Grade 1. All positions, the compensation of which is at the rate of not more than four hundred dollars per annum.

Grade 2. All positions, the compensation of which is at the rate of more than four hundred dollars and not more than seven hundred dollars per annum.

Grade 3. All positions, the compensation of which is at the rate of more than seven hundred dollars and not more than one thousand dollars per annum.

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Grade 4. All positions, the compensation of which is at the rate of more than one thousand dollars and not more than fifteen hundred dollars per annum.

Grade 5. All positions, the compensation of which is at the rate of more than fifteen hundred dollars and not more than two thousand dollars per annum.

Grade 6. All positions, the compensation of which is at the rate of more than two thousand dollars and not more than twenty-five hundred dollars per annum.

Grade 7. All positions, the compensation of which is at the rate of more than twenty-five hundred dollars per annum.

8. For the purposes of this section, full maintenance in state institutions shall be valued at \$150.00 per annum.

RULE XVI.

Reductions.

1. Whenever an employee is reduced in pay or position the appointing officer shall file with the commission a statement in writing of the causes for such reduction.

RULE XVII.

LABOR CLASS.

Registration Officers.

a. The labor class shall include ordinary unskilled laborers. (From section XXI.)

b. There may be separate lists of applicants for different kinds of labor or employments and the commission may establish separate labor lists for various localities, institutions and departments. (From section XXI.)

1. The commission may appoint in any county or district in which is located a state charitable or penal institution or state educational institution, a local registration officer for registrations in the labor class, and in case such registration officer is not in the employ of the state, may fix his compensation.

2. The local registration officer shall, subject to the regula-

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tions of the commission, keep a register of all accepted applicants in the labor class and shall keep the commission informed of all names recommended to appointing officers, all changes in the local register, including all appointments from the register, all additions to the register, and all delinquencies of applicants, and shall be guided by such instructions as the commission may from time to time furnish him.

Examinations.

c. The commission shall require an applicant for registration for the labor service before he can be registered to furnish such evidence or to pass such examination as they may deem proper with respect to his age, residence, physical condition, ability to labor, sobriety, industry, capacity and experience in the employment for which he applies. (From section XXI.

3. Veterans of the late civil war shall be required to pass the same examination as may be required for other candidates for positions in the labor class, except as to age.

4. The commission may require a medical examination whenever in its judgment such examination is deemed necessary, and may require that the expense of such examination shall be borne by the applicant.

Registration of Eligibles.

5. The names of all accepted applicants shall remain on the register for one year except as follows:

a. When an application, together with a report of former employers, shows an applicant unfit or unworthy to serve the state, the commission shall immediately notify the local registration officer who shall strike the applicant's name from the register.

b. Any applicant who fails to keep the local registration officer and the commission informed of his post office address or who fails to reply promptly to notices of appointment, or who fails to give satisfactory reasons for refusing to accept service, or who is found to have intentionally made false and misleading statements in an application, shall have his name stricken from the register.

6. Whenever an applicant for registration in the labor class shall have been rejected, notice of such rejection shall be mailed to him.

The Civil Service Rules.

d. Where the labor service of any institution or department extends to separate localities, the commission may provide separate registration lists for each district or locality. (From section XXI.)

7. Preference in registration shall be given to applicants whose qualifications, determined by their applications and testimonials and such other examination as may be required, most nearly approach the standards set by the commission as to age, citizenship, physical condition, character and habits, and previous experience and efficiency.

8. In accordance with the standard established by the commission all applicants for positions in the labor class shall be graded as follows:

Grade 1 shall include all applicants whose qualifications are marked by the commission as "good", which term shall signify a reasonable conformity established by the commission as provided for in section 7 of this rule.

Grade 2 shall include all other accepted applicants.

9. It being the avowed policy of the state that preference in appointment shall be given to applicants whose qualifications best fit them for the service required, preference shall be given to applicants registered in grade 1, and no recommendations for appointment shall be made from grade 2, except where there are less than three eligible applicants registered in grade 1, whose qualifications fit them for the service required.

10. No person who has been discharged for misconduct shall be again eligible for registration for at least one year after the time that he is discharged.

Certification and Appointment.

e. Vacancies in the labor class shall be filled by appointment from lists of applicants registered in their respective localities by the civil service commission according to rules and regulations determined by said commission except in cases of temporary employment. (From section XXI.)

11. Whenever an appointing officer shall request a certification from the commission, or from a local registration officer of names of persons for appointment to any position in the labor class, the secretary of the commission or the local registration officer, as the case may be, shall certify to the appointing officer for appointment the names of three persons (if there

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be so many registered in the grade and class entitled to preference) whose applications bear earliest date and number.

12. If the appointing officer shall notify the commission of more than one vacancy at any time, the secretary or registration officer shall certify to the appointing officer the names of as many persons as there are vacancies to be filled, with the addition of two names.

13. Whenever the sex of those whose names are to be certified is fixed by any law, rule or regulation of the commission, or is specified in the request for certification, the names of those of the sex so fixed or specified shall be certified, but in other cases certification shall be made without regard to sex.

14. In cases of emergency, appointments to permanent positions in the labor class may be made without regard to the list, but no emergency appointment shall continue more than ten days.

15. In filling permanent positions in the labor class, appointing officers may, when a local registration list has been exhausted, or when, because of the peculiar nature of the duties of the position to be filled, it is found inexpedient or impracticable to make a selection from the local list, make requisition upon the commission for a list of candidates registered for service in the state at large.

16. Where the service to be rendered by an appointee in the labor class is for a temporary period not to exceed one month, and the need of such service is immediate and urgent, the appointing officer may select for such temporary service any person whose name appears on the register. But when the local registration list is exhausted, the appointing officer may make his selection without reference to the rules and regulations of the commission.

RULE XVIII

Recommendations.

a. No recommendation for any person who shall apply for office or place, or for examination or registration under the provisions of this act, or of the rules established pursuant thereto, except as to character, and, in the case of former employers, as to ability, shall be given

The Civil Service Rules.

to, or considered by any person concerned in making any examination, registration, appointment, promotion, or reinstatement under this act, and the rules made pursuant thereto. No recommendation whatsoever shall relate to the political or religious opinions of any applicant. (From section XXV.)

b. No recommendation for the promotion of any person in the classified service shall be considered by any person concerned in making promotions except it be made by the officer or officers under whose supervision or control such employee is serving. (From section XXV.)

c. Any recommendations made contrary to the provisions of this section with the knowledge and consent of the applicant or employee shall be sufficient cause for refusing his application or appointment, or for debarring him from the promotion proposed, and a repetition of the offense shall be sufficient cause for removing him from the service. (From section XXV.)

d. All recommendations of applicants for office received by the said commission, or by any appointing officer, shall be kept and preserved by the commission, and all such records, recommendations of former employers excepted, and all written causes of removal and answers thereto filed with it, shall, subject to reasonable regulations, be open to public inspection. (From section VII.)

RULE XIX.

Roster.

1. In accordance with the provisions of section 24 of the law and subject to the regulations of the commission, the secretary or president of the commission shall compare each pay roll, estimate or account for services, with the official roster and shall attach thereto or place thereon a certificate in form prescribed by the commission.

RULE XX.

Regulations.

1. The commission shall prescribe and enforce suitable regulations for carrying into effect the provisions of these rules and those of the civil service law not inconsistent therewith and shall prescribe blank forms for all applications, certificates, reports, records and returns required under these rules and the regulations made in pursuance thereof.

The Civil Service Rules.

The foregoing rules, prepared and adopted by the State Civil Service Commission are hereby transmitted to the Governor for his approval.

T. J. CUNNINGHAM,

S. E. SPARLING,

OTTO GAFFRON,

State Civil Service Commissioners.

December 12, 1905.

The foregoing rules prescribed by the State Civil Service Commission, are hereby approved.

ROBERT M. LAFOLLETTE,

Governor.

State of Wisconsin,

Executive Chamber.

December 14, 1905.

PART VIII.



Regulations of the Civil Service Commission.

REGULATIONS.

ADOPTING ORDER.

The State Civil Service Commission under the authority conferred by section 7 of the Civil Service Law and rule 20 of the rules prescribed pursuant thereto, approved by the governor, and promulgated on the 14th day of December, 1905, hereby makes the following regulations, reserving the right to modify the same from time to time, and to prescribe such special regulations as may be expedient for the proper enforcement of the rules aforesaid.

REGULATION I.

The President.

1. The president, subject to the direction of the Commission, shall have such general authority and responsibility in the administration of the law, rules and regulations as shall not be inconsistent with the powers reserved to the Commission or vested in some other officer.

REGULATION II.

Chief Examiner and Secretary.

1. The chief examiner and secretary, subject to the direction of the Commission, shall be governed as follows:

2. He shall keep the minutes of the proceedings of the Commission, have charge of all books, records, accounts, papers, the official seal and other property of the Commission.

3. He shall prepare blank forms for applicants for examination, registration or certification, receive all applications for examination and keep a register of applicants.

Regulations.

4. He shall supervise the preparation of questions and make all other necessary preliminary arrangements for examinations, issue authority to local examining boards to hold examinations and assign and direct their work. He shall supervise and pass upon the marking and grading of all examination papers, shall determine all questions of eligibility, notify candidates of the result of their examination and enter names of successful competitors upon the proper register of eligibles.

5. He shall make certification to appointing officers upon their request of the names of those eligible to appointment for employment.

6. He shall keep the official roster and pass upon all pay-rolls of persons employed in the classified service in the various departments.

7. He shall conduct the correspondence of the Commission and perform such other appropriate duties as may from time to time be assigned to him by the Commission.

REGULATION III.

Applications.

1. Applicants for positions in the recognized mechanical trades, must have had not less than two years' continuous successful experience in the practice of their trade, in addition to such time as they may have served as apprentices. For head mechanics having supervisory charge of work a longer term of experience will be required, and previous experience as a supervisor or foreman may also be required.

2. The chief examiner shall upon receiving the application of a candidate for examination take such steps as may be necessary to determine whether his preliminary qualifications entitle him to compete in the examination, and, in case they are found satisfactory, he shall mail the candidate a notification which shall also serve as an admission card to the examination.

3. Any applicant who fails to receive notice from the Commission of an examination, or who gives satisfactory reasons for failure to attend, shall be notified to attend the next examination for the same class or group provided such examination is held within one year from the date of filing the original application.

Regulations.

4. Defective applications will be returned to applicants with a notice to amend the same but will not be returned a second time.

5. Applications, must, in all cases, be made upon the blanks furnished by the Commission and must be received at least six days prior to the time set for the examination. Late applicants will be admitted in all cases where practicable.

REGULATION IV.

Examiners.

1. All persons having charge of the preparation of questions, or of marking of examination papers, shall use due diligence in preserving secrecy, both as to the nature of the forthcoming examination and as to details of examination papers. Applicants should be seated apart.

2. The marking of each question or subject shall be made on a scale of 100, which shall represent entire accuracy. Handwriting will be judged by its legibility uniform and correct formation of letters and ease of execution. Upon a comparison of the handwriting of all, the best and worst should be first determined, and the two extremes of the scale thus fixed; the others should be marked relatively to them. In writing from dictation or copying from manuscript, the omission, repetition or substitution of words, the erasures, blots and other evidences of carelessness, will reduce the marking below 100. Abstracts or summaries of documents and letter-writing, will be marked as in handwriting, by determining the best and worst examples; and the examiners, having marked these, will then mark the others proportionately.

3. In each of the other subjects, each question shall be marked on a scale of 100; and the sum of such markings, divided by the number of questions in that subject, shall determine the standing on such subject.

4. Supervising examiners in charge of examinations shall take all due precautions, and use such measures as may be needful to prevent fraud and collusion.

5. All examination questions, together with the instructions governing the competitive examinations, will be forwarded to

Regulations.

the local boards of examiners at least five days prior to the date of holding the examination. The package containing examination questions and instructions shall not be opened except in the presence of competitors at the hour set for the examination.

REGULATION V.

Competitive Examinations.

1. Applicants must present themselves punctually at the times and places specified in their official notices to attend, and they will be admitted to examination upon the production of such notices.

2. In order to identify competitors, each competitor shall be required at the opening of an examination to fill out an identification sheet furnished him by the local examiner. He will be furnished with a supply of concealed examination numbers. One of these he will attach to his identification sheet; the others shall be retained by him to be attached to each of his examination papers. His name shall not appear in his examination in any other place than upon the identification sheet. Immediately upon filling out the identification sheet the applicant shall enclose it in a sealed envelope which shall be opened in the office of the Commission, only after all examination papers have been marked and graded.

3. No instructions or explanations in reference to examination shall be given to applicants separately, but all shall be publicly announced to all persons in the examination room and shall, so far as possible, be confined to such as are furnished in printed or written form by the Commission.

4. Candidates shall not leave the room with a paper unfinished except in cases of extreme necessity and only with permission of the supervising examiner and such permission shall in each case be reported by name to the chief examiner.

5. All communication or conversation shall be strictly prohibited and the slightest violation of this rule shall be reported by name to the chief examiner. Candidates may bring pens, pencils and ink but shall not be permitted to carry with them upon entering or leaving the examination room, blotters, blank paper, scratch paper, any note books, books or pamphlets. Each

Regulations.

applicant shall be required to complete his examination within the allotted time.

6. The local examining board shall report by applicant's name any violation on his part of the rules, regulations, and instructions governing examinations.

7. At the close of an examination the supervising examiner shall collect all question papers, examination papers, scratch papers and blotters issued to the candidates and shall return all question papers and examination papers to the chief examiner.

8. The percentage attained in each subject for examination shall be multiplied by the weight prescribed for each by the Commission; and the quotient found by the division of the aggregate of value so arrived at, of each applicant, by the aggregate of weights shall constitute the percentage of condition of such applicant.

REGULATION VI.

Eligibles.

1. No person shall have his name entered upon the eligible list who fails to attain an average percentage of 70 or over on all required subjects.

2. Lists of eligibles may be made public, but the names of applicants failing to obtain standing on eligible lists will not be made public nor will their examination papers be exhibited, nor will any information be given about them.

3. Every application paper and accompanying certificate will remain on file in the office of the Commission, and under no circumstances or conditions will the originals be returned to the applicant.

REGULATION VII.

Information.

1. Copies of questions used in examination will not be furnished except where they are published by the Commission for general information.

2. Abstracts of the law, rules and regulations and other pertinent matter will be published by the Commission from time

Regulations.

to time, for the information of appointing officers, applicants, candidates and others concerned.

3. The Commission cannot undertake to answer inquiries relating to cases which are not officially before it for decision, nor can it decide, except in cases of actual candidates, questions respecting the application of the rules and regulations.

4. Particular answers cannot be given to inquiries which are answered expressly or by implication in published regulations or other similar documents.

5. The Commission cannot give any information upon the following points: (a) regarding positions in the unclassified service or in the exempt class of the classified service; (b) regarding vacancies in any position existing or prospective; (c) regarding the duties of positions except as indicated by their classification; (d) regarding the personal interests of any intending or actual applicant, candidate or eligible.

6. The examination papers of a competitor will be exhibited only to the competitor or his duly authorized representative, or to the appointing officer to whom his name is certified.

7. The qualifications of applicants and subjects of examination, as prepared from time to time, will be published, but in regard to certain positions in which vacancies are rare the nature and extent of the examinations may not be determined until vacancies occur.

8. Applicants shall be notified of the results of their examination.

REGULATION VIII.

Pay-rolls.

1. Pay-rolls of the classified service shall be made in duplicate, whenever requested, and a copy shall be filed permanently with the records of the Commission.

REGULATION IX.

Labor Class.

1. Application blanks and instructions for registering applicants will be furnished the local registration officer by the Commission, and the applicants shall be registered by him in the order in which applications are received.

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REGULATION X.

Meetings.

1. Regular meetings of the Commission shall be held at the capitol on the third Thursday of each month at two o'clock P. M., but other meetings at which any official business may be transacted may be called by the president.

By the Commission.

Attest

F. E. DOTY,

Secretary and Chief Examiner.

Madison, Wis., Dec. 21, 1905.

PART IX.



Roster of Employees in the Classified Service.

ROSTER OF EMPLOYES IN THE CLASSIFIED SERVICE.

STATE BOARD OF ASSESSMENT.

Name.	Position.	Compensation.
EXEMPT CLASS.		
Bertha D. Moritz	Stenographer	\$50 00
COMPETITIVE CLASS.		
W. D. Pence	Engineer	125 00
C. M. Larson	Assistant Engineer	125 00
L. A. Anderson	Statistician	125 00
T. S. Adams	Expert Special Agent	200 00
A. E. James	Special Agent	100 00
Miss Katherine Luft	Assistant	40 00
Miss Hazel Higbee	Assistant	30 00
Miss Georgia M. Martin	Assistant	30 00
Mrs. M. E. B. Thompson	Assistant	30 00

ATTORNEY GENERAL'S DEPARTMENT.

Name.	Position.	Compensation.
EXEMPT CLASS.		
Albert C. Titus	First Assistant	\$167 00
Meda Sturdevant	Stenographer	75 00
COMPETITIVE CLASS.		
Frank T. Tucker	Second Assistant	\$150 00
Joseph E. Messerschmidt	Law Examiner	125 00
Calvin A. Stedman	Clerk	84 00
Fannie G. Clemons	Messenger	60 00

STATE BOARD OF CONTROL.

Name.	Position.	Compensation.
EXEMPT CLASS.		
M. J. Tappins	Secretary	\$167 00
Frances R. Dunn	Stenographer	60 00
COMPETITIVE CLASS.		
A. C. Lerum	Chief Clerk	\$100 00
H. F. Ierdall	Assistant Chief Clerk	75 00
Wm. F. Bart	Clerk	60 00

Roster of Employees in the Classified Service.....	183-208

DAIRY AND FOOD COMMISSIONER'S DEPARTMENT.

Name.	Position.	Compensation.
EXEMPT CLASS.		
U. S. Baer	Assistant Commissioner	\$133 33
Ethel D. Thomas	Stenographer	75 00
COMPETITIVE CLASS.		
Richard Fischer	Chemist	\$150 00
J. G. Moore	Second Assistant Commissioner	133 33
F. M. Buzzell	Chief Food Inspector	100 00
A. E. Kundert	Assistant Chemist	100 00
F. E. Carswell	Cheese Factory, Dairy and Food Inspector	100 00
E. L. Aderhold	Cheese Factory, Dairy and Food Inspector	100 00
Fred Marty	Cheese Factory, Dairy and Food Inspector	100 00
J. D. Cannon	Cheese Factory, Dairy and Food Inspector	100 00
T. Cornelluson	Creamery, Dairy and Food Inspector	100 00
H. C. Larson	Creamery, Dairy and Food Inspector	100 00
P. A. Larson	Creamery, Dairy and Food Inspector	100 00
Harry Klueter	Assistant Chemist	50 00
James Van Duser	Creamery Inspector, per day	3 00
Will McAdam	Creamery, Dairy and Food Inspector, per day	3 00
W. F. Scott	Food Inspector, per day	3 00

DEPARTMENT OF STATE CIVIL SERVICE.

Name.	Position.	Compensation.
EXEMPT CLASS.		
F. E. Doty	Secretary and Chief Examiner	\$208 34
Caroline B. Greig	Stenographer	60 00
COMPETITIVE CLASS.		
J. M. Sexton	Chief Clerk	\$100 00
Louise Knoepfle	Clerk, temporarily	35 00
Frank Fawcett	Clerk and Reader	37 50

Roster of Employes in the Classified Service.

COMMISSIONERS OF FISHERIES.

Name.	Position.	Compensation.
EXEMPT CLASS.		
James Nevin	Superintendent	\$166 66
Arthur Sykes	Clerk	100 00
COMPETITIVE CLASS.		
Valentine Maag	Foreman	\$70 00
Albert Gallagher	Foreman	60 00
Frank C. Ramsdale	Foreman	60 00
John Maag	Foreman	40 00
Robert Ripple	Foreman	70 00
Henry Sykes	Foreman	100 00
LABOR CLASS.		
Wilmot Nevin .....	.....	\$50 00
James Foy .....	.....	50 00
Bernard Holtman .....	.....	50 00
Andrew Gilquist .....	.....	52 00
George D. Phinney .....	.....	20 00
Henry Hagberg .....	.....	40 00
Hugo Dufva .....	.....	40 00

STATE BOARD OF FORESTRY.

Name.	Position.	Compensation.
EXEMPT CLASS.		
E. M. Griffith	State Forester	\$209 00
COMPETITIVE CLASS.		
F. B. Moody	Ass'tant State Forester	125 00
M. A. Castle	Clerk	66 00

FREE LIBRARY COMMISSION.

Name.	Position.	Compensation.
EXEMPT CLASS.		
Lucy M. Curtiss	Stenographer	\$50 00
COMPETITIVE CLASS.		
Bessie McKee	Stenographer	\$30 00
A. L. Mayers	Clerk	75 00
Mrs. Corcoran	Care-taker Library School	10 63
Paul Priest	Messenger	30 00
Bertha Matson	Stenographer	30 00

Roster of Employees in the Classified Service.

DEPARTMENT OF STATE GAME WARDEN.

Name.	Position.	Compensation.
EXEMPT CLASS.		
C. D. Nelson	Assistant	\$125 00
COMPETITIVE CLASS.		
		per day.
Robert Bacon	Deputy	\$2 50
M. E. Berg	Deputy	2 50
H. A. Bowman	Deputy	2 50
John Buckley	Deputy	2 50
Mat. Christiansen	Deputy	2 50
J. S. Craig	Deputy	2 50
Robert Clark	Deputy	2 50
Peter Drafahl	Deputy	2 50
M. H. Early	Deputy	2 50
C. E. Follett	Deputy	2 50
Fred Gerhardt	Deputy	2 50
A. W. Gratz	Deputy	2 50
H. C. Gruebner	Deputy	2 50
William Haslam	Deputy	2 50
William Hegeman	Deputy	2 50
Robert Hitchon	Deputy	2 50
J. B. Hill	Deputy	2 50
H. W. Huebrandt	Deputy	2 50
G. F. Hull	Deputy	2 50
E. L. Immel	Deputy	2 50
C. W. Johnson	Deputy	2 50
G. L. Kingsley	Deputy	2 50
S. B. Kirkoff	Deputy	2 50
C. L. Kleinsteiber	Deputy	2 50
Michael Kleist	Deputy	2 50
A. J. Kiofanda	Deputy	2 50
G. C. Kolb	Deputy	2 50
W. C. Kroening	Deputy	2 50
A. A. Lavall	Deputy	2 50
H. O. Lund	Deputy	2 50
C. S. Little	Deputy	2 50
James McGinty	Deputy	2 50
Pat McManus	Deputy	2 50
R. G. Mason	Deputy	2 50
G. L. Miller	Deputy	2 50
Ed. O'Connor	Deputy	2 50
Jim Oberholtzer	Deputy	2 50
F. M. Perry	Deputy	2 50
John Pugh	Deputy	2 50
Val Raeth	Deputy	2 50
O. E. Rooth	Deputy	2 50
C. W. Sizer	Deputy	2 50
J. W. Stone	Deputy	2 50
A. E. Storrs	Deputy	2 50
J. D. Stuart	Deputy	2 50
O. W. Sholts	Deputy	2 50
E. W. Tuttle	Deputy	2 50
Martin Tollefson	Deputy	2 50
Herman Vollbrecht	Deputy	2 50
P. E. Waterbury	Deputy	2 50
Samuel H. Longdin	Deputy	2 50
F. P. Brown	Deputy	2 50
G. W. Dart	Deputy	2 50
G. W. Foster	Deputy	2 50
J. T. Hanson	Deputy	2 50
J. H. Hatt	Deputy	2 50

Roster of Employes in the Classified Service.

STATE BOARD OF HEALTH AND VITAL STATISTICS.

Name.	Position.	Compensation.
EXEMPT CLASS.		
A. A. Walter		\$65 00
COMPETITIVE CLASS.		
L. W. Hutchcroft		\$100 00
Gertrude McCutchin		45 00
Alma Anderson		40 00
May Wolf		35 00

DEPARTMENT OF INSURANCE.

Name.	Position.	Compensation.
EXEMPT CLASS.		
T. M. Purtell	Deputy Insurance Commissioner	\$125 00
N. J. Frey	Stenographer	60 00
COMPETITIVE CLASS.		
A. E. Chrystal	Chief Clerk	\$100 00
P. D. Gurnee	Actuary	100 00
W. G. End	Examiner	100 00
F. H. Bryant	Clerk	100 00
W. H. Glenz	Clerk	100 00
Mary Montelth	Filing Clerk	75 00
Eugene Shepard	Messenger and Mailing Clerk	75 00

BUREAU OF LABOR AND STATISTICS.

Name.	Position.	Compensation.
EXEMPT CLASS.		
W. J. Ligenah	Deputy Commissioner	\$125 00
Hannah Davidson	Stenographer	60 00
COMPETITIVE CLASS.		
W. O. Pietzsch	Clerk	\$109 00
E. J. Filby	Clerk	84 00
Rena Beck	Clerk	62 00
J. E. Vailler	Factory Inspector	100 00
J. A. Norris	Assistant Factory Inspector	84 00
August Lehnhoff	Assistant Factory Inspector	84 00
A. L. Raems	Assistant Factory Inspector	84 00
H. P. Peterson	Assistant Factory Inspector	84 00
T. A. Walby	Assistant Factory Inspector	84 00
J. R. Bloom	Assistant Factory Inspector	84 00
J. D. Evans	Assistant Factory Inspector	84 00
C. S. Porter	Assistant Factory Inspector	84 00
D. Wittenberg, Jr	Assistant Factory Inspector	84 00
Wm. Straub	Assistant Factory Inspector	84 00
C. J. Kremer	Bakery Inspector	84 00
Edessa Kunz	Assistant Factory Inspector (woman)	84 00

Roster of Employees in the Classified Service.

STATE HISTORICAL SOCIETY.

Name.	Position.	Compensation.
COMPETITIVE CLASS.		
Orley Le Hew	Janitor and Mechanic	\$50 00
Ceylon C. Lincoln	Janitor and Mechanic	50 00
Magnus Nelson	Janitor and Mechanic	60 00
LABOR CLASS.		
Elizabeth Alshelmer	Housemaid	\$30 00
Bennie Butts	Office Messenger	48 00
Tillie Gunkel	Housekeeper	31 43
Bryan Howley	Elevator Attendant	15 00
Anna Mausbach	Housemaid	27 00
Elizabeth Schmelzer	Housemaid	27 00
Edna Teude	Housemaid	30 00

DEPARTMENT OF PUBLIC LANDS.

Name.	Position.	Compensation.
EXEMPT CLASS.		
B. J. Castle	Chief Clerk	\$150 00
Ella Kempf	Stenographer	50 00
COMPETITIVE CLASS.		
W. H. Bennett	Assistant Chief Clerk	\$124 00
A. W. Pott	Bookkeeper	116 00
M. Lampert	General Clerk	92 00

Roster of Employes in the Classified Service.

BOARD OF NORMAL SCHOOLS.

Name.	Position.	Compensation.
EXEMPT CLASS.		
May Buchanan	Stenographer	\$80 00
William Kittle	Secretary	167 00
COMPETITIVE CLASS.		
Milwaukee:		
Maud Burdick	Clerk	\$75 00
Otto Schmidt	Engineer	70 00
Paul Seith	Janitor	110 00
Alice Free	Assistant Clerk	40 00
Oshkosh:		
Clara E. Marvin	Stenographer	70 00
Evan Vincent	Janitor	55 00
L. W. Vosberg	Engineer	70 00
Platteville:		
Bella Burke	Clerk	55 00
W. A. Henry	Janitor	50 00
John Rickard	Engineer	50 00
River Falls:		
William Currier	Clerk	60 00
John Sherburne	Janitor	50 00
F. B. Thayer	Engineer	60 00
Stevens Point:		
Beulah A. Thompson	Clerk	60 00
Bruce Wilcox	Engineer and Janitor	50 00
Albert Landowski	Assistant Janitor	45 00
Superior:		
E. J. Howard	Engineer	75 00
M. O'Hara	Janitor	60 00
Leona Pinkham	Clerk	60 00
Whitewater:		
William C. Niepert	Stenographer	60 00
James O'Neill	Janitor	55 00
W. B. Reider	Engineer	55 00

Roster of Employees in the Classified Service.

OIL INSPECTION DEPARTMENT.

Name.	Position.	Compensation.
COMPETITIVE CLASS.		
James McGee	Inspector	Fees.
Anton Hansen	Inspector	Fees.
Harvey E. Grace	Inspector	Fees.
C. L. Graham	Inspector	Fees.
Samuel Mitchell	Inspector	Fees.
J. B. Stupfell	Inspector	Fees.
Herb. A. Beach	Inspector	Fees.
J. L. Kelley	Inspector	Fees.
C. B. Conrad	Inspector	Fees.
C. A. Lytle	Inspector	Fees.
Alex. Wilson	Inspector	Fees.
James Harclerood	Inspector	Fees.
W. P. Peters	Inspector	Fees.
H. C. Winter	Inspector	Fees.
J. B. Hicks	Inspector	Fees.
Conrad Engsberg	Inspector	Fees.
J. B. Christoph	Inspector	Fees.
C. L. Brink	Inspector	Fees.
Charles Mohr	Inspector	Fees.
E. J. Battles	Inspector	Fees.
W. L. Wightman	Inspector	Fees.
Joseph Omundson	Inspector	Fees.
J. C. Niedbalski	Inspector	Fees.
C. E. Bell	Inspector	Fees.
L. C. Bronstad	Inspector	Fees.
H. A. Well	Inspector	Fees.
Geo. H. Ferris	Inspector	Fees.
Christ Zelle	Inspector	Fees.
Oscar M. Lindholm	Inspector	Fees.
Ava Sprague	Inspector	Fees.
Robert Leith	Inspector	Fees.
Frank B. St. Louis	Inspector	Fees.
J. C. Mitchell	Inspector	Fees.
C. H. Wood	Inspector	Fees.
James Campbell	Inspector	Fees.
Nicholas Gruber	Inspector	Fees.
J. C. Taggart	Inspector	Fees.
Ole J. Berg	Inspector	Fees.
J. W. Schur	Inspector	Fees.
Ambrose Cook	Inspector	Fees.
Robert Dinsmore	Inspector	Fees.
G. P. Thompson	Inspector	Fees.
Casper Lebel	Inspector	Fees.
August F. Kroening	Inspector	Fees.
H. A. Kohl	Inspector	Fees.
R. P. Smith	Inspector	Fees.
E. A. Peterson	Inspector	Fees.
Geo. J. Ponthrland	Inspector	Fees.
R. M. Douglass	Inspector	Fees.
C. S. Stimers	Inspector	Fees.
Theo. Berger	Inspector	Fees.
H. LeGendre	Inspector	Fees.
John R. Anderson	Inspector	Fees.
Fred Westman	Inspector	Fees.
A. E. Nelson	Inspector	Fees.
J. F. Nason	Inspector	Fees.
S. E. Washburn	Inspector	Fees.

Roster of Employes in the Classified Service.

DEPARTMENT OF PUBLIC PROPERTY.

Name.	Position.	Compensation.
EXEMPT CLASS.		
Charles G. Bennett	Assistant Superintendent	\$125 00
Sarah A. Gilbert	Stenographer (½ time)	30 00
COMPETITIVE CLASS.		
Levi M. Breese	Chief Clerk	\$116 67
L. L. Ketchum	Chief Engineer	100 00
Joseph Ennis	Assistant Engineer	90 00
Anton Lawrence	Assistant Engineer	80 00
Wesley M. Ketchum	Electrician and other work and Assistant Engineer	75 00
James Priest	State Carpenter	83 33
George H. Mason	First Assistant Carpenter	75 00
S. H. Rannels	Second Assistant Carpenter	65 00
Edward Harrington	Fireman	65 00
Charles Beyler	Fireman	65 00
Peter Lynaugh	Fireman	65 00
Wm. H. Henwood	Painter	75 00
Tollef O. Homme	Assistant Painter	65 00
Arthur M. Gildden	Gasfitter and Plumber	70 00
Michael Kurz	Receiving and Shipping Clerk	75 00
Matthew Ford	Police	62 00
Martin Matzdorf	Police	62 00
S. T. Dodge	Police	62 00
Matthew Lavin	Police	62 00
W. H. Cobb	Police	62 00
Robert Lafferty	Police	62 00
Stephen C. Bass	Police	62 00
George Bancroft	Police	62 00
Nath. A. Crampton	Night Watchman	62 00
John Lyons	Night Watchman	62 00
James Rasmussen	Elevator Operator	62 00
Charles Oleson	Janitor	62 00
Frank Higgins	Janitor	62 00
K. W. Jensen	Janitor	62 00
Ole O. Elverkrug	Janitor	62 00
C. C. Howard	Janitor	62 00
C. H. Wanamaker	Janitor	62 00
Evan Eckern	Janitor	62 00
James Arnold	Janitor	62 00
William Miller	Janitor	62 00
John Lorch	Janitor	62 00
J. C. Bridge	Janitor	62 00
Frank L. Vall	Janitor	62 00
R. N. Qualley	Carpetman	62 00
LABOR CLASS.		
Lars T. Bakken	Cuspidor Cleaner	\$55 00
John Schermerhorn	Laborer	55 00
J. D. Gilbert	Laborer	55 00
Erick Anderson	Laborer	55 00
Wm. Prout	Laborer	55 00
T. J. Davies	Laborer	55 00
Patrick Doyle	Laborer	55 00
George Coulter	Laborer	55 00
Andrew Peterson	Laborer	55 00
Richard Comeford	Laborer	55 00
M. L. Ensign	Laborer	55 00
C. W. Verbeck	Laborer	55 00
Emery J. Halseth	Laborer	55 00
Patrick Marks	Laborer	55 00
J. B. McCoy	Laborer	55 00
Mary D. Rinzo	Scrubwoman	37 50
Mary Wrice	Scrubwoman	37 50
Mary Roberts	Scrubwoman	37 50
Bertha Hazenbacker	Scrubwoman	37 50
Lena Starkweather	Scrubwoman	37 50

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Roster of Employees in the Classified Service.

DEPARTMENT OF PUBLIC PROPERTY—Continued.

EXTRA PAY ROLL

Name.	Position.	Compensation.
COMPETITIVE CLASS.		
Charles Gussman	Carpenter	\$75 00
Alta E. Bradley	Statistical Clerk	55 00
Max Kufalk	Statistical Clerk and Stenographer ..	35 00
L. B. Webster	Statistical Clerk	55 00
LABOR CLASS.		
John Hoffman	Laborer	\$55 00
John Shetter	Laborer	55 00
William Kayser	Laborer	55 00
Alfred Emerson	Laborer	55 00
Washington Mason	Laborer	55 00

RAILROAD COMMISSION.

Name.	Position.	Compensation.
EXEMPT CLASS.		
J. M. Winterbotham	Secretary	\$208 33
W. C. Daumling	Stenographer	125 00
COMPETITIVE CLASS.		
A. E. Emerson	Clerk	\$35 00
J. F. Hogan	Clerk	83 33
J. E. Usher	Clerk	83 33
C. E. Schrelber	Expert	80 00
Clarence Hartley	Expert Stenographer	50 00
S. W. Gilman	Expert	100 00

DEPARTMENT OF EDUCATION.

Name.	Position.	Compensation.
EXEMPT CLASS.		
J. B. Borden	Assistant Superintendent	\$150 00
Mary A. Messerschmidt	Stenographer	90 00
COMPETITIVE CLASS.		
L. W. Wood	Rural School Inspector	\$167 00
H. L. Teriy	High School Inspector	150 00
C. L. Harper	Chief Clerk	175 00
Maud Barnett	Library Clerk	117 00
Winona Merrick	Index and Filing Clerk	84 00
Hattie G. Milhaupt	Mailing Clerk	84 00
Walter H. Hunt	State School Inspector	134 00
George H. Drewry	State School Inspector	134 00
Anna E. Schaffer	Deaf School Inspector	125 00

Roster of Employees in the Classified Service.

DEPARTMENT OF STATE.

Name.	Position.	Compensation.
EXEMPT CLASS.		
F. M. Miner	Assistant Secretary of State	\$167 00
Dorothy Dunn	Stenographer	75 00
COMPETITIVE CLASS.		
C. K. Lush	Chief Clerk	\$150 00
S. T. Walker	Incorporation Clerk	116 00
J. C. MacKenzie	Filing Clerk	116 00
J. H. Healy	Chief Bookkeeper	150 00
J. T. Lee	First Assistant Bookkeeper	134 00
Don Sherman	Second Assistant Bookkeeper	109 00
G. H. Short	Recording clerk	100 00
A. J. Cobban	Registration Clerk	100 00
T. Murphy	Notarial Clerk	109 00
Claire Cook	Warrant Clerk	100 00
H. Howett	Shipping Clerk	100 00
G. S. Post	Printing Clerk	125 00
Fred Wylie	Assistant Printing Clerk	84 00
William Commerford	Statistical Clerk	100 00
Joe Cannon	Clerk	100 00
Joe Edwards	Vault Clerk	100 00
John Lorrigan	Clerk	100 00
Anna Kolb	Clerk	100 00
Grace Pierce	Clerk	100 00

STATE TREASURER'S OFFICE.

Name.	Position.	Compensation.
EXEMPT CLASS.		
Walter S. Denning	Assistant Treasurer	\$166 00
Ella J. Kempf	Stenographer	60 00
COMPETITIVE CLASS.		
Arthur Pugh	Bookkeeper	\$150 00
A. H. Wagner	Bookkeeper	150 00
I. P. Leigh	Corresponding Clerk	133 00
Chester Wilcox	Deposit Clerk	116 00
Louis P. Rupp	Mailing Clerk	100 00
S. A. Madigan	Commercial Clerk	100 00
Julius O. Roehl	Night Watchman	62 00

TAX COMMISSION.

Name.	Position.	Compensation.
EXEMPT CLASS.		
George H. Francis	Secretary	\$167 00
Elizabeth M. Barnes	Stenographer	80 00
COMPETITIVE CLASS.		
Anna W. Evans	Index Clerk and Librarian	\$85 00
Edmund J. Brabant	Clerk	65 00

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Roster of Employees in the Classified Service.

UNIVERSITY.

Name.	Position.	Compensation.
EXEMPT CLASS.		
E. F. Riley.....	Secretary	\$250 00
Katherine Spencer	Stenographer and Clerk.....	75 00
COMPETITIVE CLASS.		
Ida Merfurth	Ex. Clerk, Co. Agr.....	\$91 66
Arthur Peabody	Sup't. Arch.....	250 00
Harry C. Alford.....	Draughtsman	60 00
Claire Parsons.....	Stenographer	50 00
Lucien J. Pickarts.....	Bursar	125 00
M. E. McCaffrey.....	Bookkeeper Regents' Office	120 00
Geo. B. Merrick.....	Accountant	91 66
Anna Hart.....	Bill and Index Clerk.....	60 00
Grace G. Hayner.....	Clerk	65 00
Henry Scameler.....	Mailing Clerk and Messenger.....	15 00
W. D. Hiestand.....	Registrar	191 66
Julia M. Wilkinson.....	President's Secretary	75 00
Magdalen Evans.....	Stenographer Registrar's Office	60 00
Violet S. Timberlake	Record Clerk	60 00
Lottie I. Schnell.....	Stenographer Registrar's Office.....	60 00
Ena Heur.....	Record Clerk	30 00
Ed. J. Lawrence.....	Mailing Clerk and Messenger.....	15 00
Fannie G. Sanford.....	Clerk and Stenog. Dean L. and S.....	60 00
Mary A. Glen.....	Clerk and Stenog. Dept. Educ.....	60 00
Mabel Raulolph.....	Clerk and Stenog. Dept. Com.....	75 00
Florence Turneure.....	Clerk and Stenog. Col. Engr.....	50 00
Alice Wulfig.....	Clerk and Stenog. Col. Engr.....	35 00
Aline Merz.....	Clerk and Stenog. Col. Law.....	50 00
Edith F. Dunton.....	Clerk and Stenog. Pol. Sci.....	75 00
Alice L. Webb.....	Clerk and Stenog. Univ. Bulletins.....	55 00
Wm. Randolph.....	Asst. Auditor	55 34
Mabelle M. Post.....	Clerk and Stenographer, Auditor.....	25 00
Mathilda L. Rider	Clerk Auditor.....	25 00
Winifred Hatch.....	Clerk and Stenographer, Obay. and Grad. Sch.....	50 00
A. W. McConnell.....	Supt. Buildings and Janitors.....	75 00
J. H. Gormley.....	Architect's Office	100 00
J. P. Foerst.....	Mechanician	100 00
E. H. J. Lorenz.....	Mechanician	110 00
Patrick Lynaugh.....	Janitor	50 00
Geo. Willett.....	Janitor	45 00
Wm. Meler.....	Janitor	15 00
Wm. Post.....	Janitor	55 00
Ira W. Kanouse.....	Janitor	45 00
Willis Morse.....	Janitor	50 00
Ernest Morschauer.....	Janitor	50 00
C. C. Kane.....	Janitor	45 00
Milo Woodbury.....	Watchman	50 00
R. J. Schanel.....	Supply Clerk	50 00
Henry Scheldeler.....	Janitor	50 00
John Bolst.....	Janitor	50 00
Mary Grasser.....	Janitor	25 00
J. J. Quan.....	Janitor	50 00
John Doescher.....	Janitor	50 00
J. C. Babcock.....	Janitor	50 00
J. E. Conohan.....	Janitor	50 00
Geo. Butler.....	Tool Room Boy.....	12 00
A. W. Steffen.....	Janitor	45 00
J. D. Donlin.....	Janitor	45 00
Wm. Wetsler.....	Engineer	40 00
J. E. Lund.....	Engineer	40 00
M. Nolan.....	Night Watch	45 00
L. M. Post.....	Machinist	75 00
Fred Horstman.....	Machinist	75 00
Ben Dressler.....	Machinist, per hour.....	22 1/2 c
Carl Nebel.....	Machinist, per hour.....	26 1/2 c
Chas. Helm.....	Steam Fitter.....	62 00
Sam K. Jones.....	Machinist	62 00
John Togstad.....	Machinist, per hour.....	36 1/2 c

Roster of Employees in the Classified Service.

UNIVERSITY—Continued.

Name.	Position.	Compensation.
COMPETITIVE CLASS.		
J. H. Rider	Valve Inspector	30 00
Thos. Ellis	Engineer	75 00
Jesse Russell	Engineer	65 00
L. D. Stevens	Engineer	65 00
Jas. Harrison	Fireman	55 00
Wm. Lamphere	Fireman	55 00
Henry Clifcorn	Fireman	55 00
Irving Mutchler	Carpenter	100 00
Chas. O. Coyne	Carpenter, per hour	30
Hugo Dohr	Carpenter, per hour	30
Christ. Swenson	Carpenter, per hour	30
Sam'l Gyles	Carpenter, per hour	28
Frank Molt	Carpenter, per hour	30
F. H. Rapp	Carpenter, per hour	30
A. J. Olson	Carpenter, per hour	30
Math. Romelfanger	Carpenter, per hour	28
M. R. Stanley	Carpenter, per hour	23
John J. Hughes	Carpenter, per hour	25
John Dresen	Carpenter, per hour	20
Ole Bayle	Carpenter, per hour	30
M. A. Janes	Carpenter, per hour	42
G. J. Scott	Carpenter, per hour	30
W. H. Godding	Mason, per hour	35
Gabe Rasmussen	Painter, per hour	30
Nick Langley	Painter, per hour	30
J. L. Grinde	Painter, per hour	20
Andrew Thompson	Electrician	100 00
Walter Lyford	Electrician, per hour	28
P. M. Anderson	Electrician, per hour	30
S. E. Sandberg	Steam Fitter	75 00
Edw. Miles	Steam Fitter	50 00
Frank Check	Steam Fitter, per hour	25
Herman Schelbel	Steam Fitter, per hour	20
A. G. Mitchell	Steam Fitter, per hour	20
Frank Colman	Steam Fitter, per hour	25
W. H. McIntosh	Steam Fitter, per hour	20
Albert Lee	Steam Fitter, per hour	20
Albert Redel	Steam Fitter, per hour	20
Louis Scherer	General work, per hour	28
S. Wehner	General work, per hour	20
G. Schmeltzer	Foreman	70 00
Wm. Diebold	Teamster	50 00
Geo. Zurian	Laborer	45 00
Henry Schofield	Laborer	50 00
H. Steenbach	Laborer, per hour	20
Geo. Anderson	Laborer, per hour	20
Jas. Butler	Laborer, per hour	20
J. H. Curtin	Laborer, per hour	20
C. H. Lang	Laborer, per hour	20
F. Gauert	Cement Finisher	55 00
J. Hoffmann	Carpenter, per day	2 70
E. M. Henwood	Bookkeeper	55 00
E. Techemeyer	Janitor, etc.	40 00
O. G. Malde	Assistant	75 00
J. R. Hatch	Dairy tests	\$79 00
J. C. Brown	Dairy tests	73 95
Robt. Charles	Janitor, per hour	20
D. B. Charles	Janitor	45 00
Nellie Griffiths	Clerk and Stenographer	50 00
Anna K. Fiedler	Stenographer	55 00
Antoinette G. Brewster	Clerk and Stenographer	45 00
Idalyn M. Bibbs	Stenographer	40 00
Sadie Mills	Stenographer	42 00
Agnes Esser	Stenographer	40 00
Vera Cobb	Stenographer	40 00
Minnie Kelly	Stenographer	40 00
Sadie Sucherland	Add. env., per hour	15
Monica Kleinheinz	Add. env., per hour	15
Agnes Wilson	Making stencils, per hour	15
LABOR CLASS.		

Eighty-five positions, compensations ranging from \$18 to \$75 per month for men.

REPORT OF THE STATE CIVIL SERVICE COMMISSION. 197

NORTHERN HOSPITAL FOR THE INSANE.

R. B.—Room and Board. B.—Board. D.—Dinner.

Name.	Position.	Compensation.
EXEMPT CLASS.		
Katherine Gllson	Stenographer .....(R. & B.)	\$30 00
NON-COMPETITIVE CLASS.		
A. . Aller	Steward .....(B.)	\$100 00
A. E. Chase.....	Assistant Steward .....(B.)	70 00
Minnie Schriber	Matron .....(R. & B.)	41 67
COMPETITIVE CLASS.		
A. Sherman	1st Assistant Physician.....(B.)	\$125 00
T. R. Jones.....	2d Assistant Physician.....(R. & B.)	83 33
J. V. N. Sonn.....	Apothecary .....(R. & B.)	35 00
Edw. Minkler.....	Supervisor .....(B.)	45 00
P. C. Hansen.....	Supervisor .....(B.)	45 00
L. Gllson	Supervisor .....(R. & B.)	45 00
Mattie Gums.....	Supervisor .....(R. & B.)	35 00
Clara Genter	Supervisor .....(R. & B.)	30 00
Johanna Proschinger	Supervisor .....(R. & B.)	30 00
Martha Schneider	Attendant .....(R. & B.)	35 00
Charles Schoenean	Attendant .....(R. & B.)	36 00
Henry Eckstein	Attendant .....(R. & B.)	33 00
George Davis	Attendant .....(R. & B.)	34 00
Hubert Johann	Attendant .....(R. & B.)	35 00
George Freeborn	Attendant .....(R. & B.)	40 00
William Griffith	Attendant .....(R. & B.)	40 00
W. N. Chase	Attendant .....(R. & B.)	29 00
W. L. Muttart	Attendant .....(R. & B.)	33 00
J. G. Montgomery.....	Attendant .....(R. & B.)	32 00
Louis Gums	Attendant .....(R. & B.)	35 00
J. N. Barr	Attendant .....(R. & B.)	29 00
W. Slattery.....	Attendant .....(R. & B.)	39 00
Fred Lake	Attendant .....(R. & B.)	27 00
Edward Hinz	Attendant .....(R. & B.)	27 00
George Boese	Attendant .....(R. & B.)	26 00
John Gilbertson	Attendant .....(R. & B.)	26 00
William Norman	Attendant .....(R. & B.)	25 00
C. L. Very	Attendant .....(R. & B.)	25 00
F. A. Siebert	Attendant .....(R. & B.)	30 00
George Nicholson	Attendant .....(R. & B.)	25 00
Otto Schmidt	Attendant .....(R. & B.)	25 00
Verne Wilmarth	Attendant .....(R. & B.)	25 00
C. W. Dale	Attendant .....(R. & B.)	26 00
E. D. Saxton	Attendant .....(R. & B.)	25 00
Walter Droege	Attendant .....(R. & B.)	25 00
Thaddeus Lalonde	Attendant .....(R. & B.)	26 00
Mame Simonin	Attendant .....(R. & B.)	22 00
Caroline Anderson	Attendant .....(R. & B.)	30 00
Mayne Humphrey	Attendant .....(R. & B.)	24 00
Della Pfell	Attendant .....(R. & B.)	20 00
Clara Baxter	Attendant .....(R. & B.)	30 00
Ella Anderson	Attendant .....(R. & B.)	23 00
Mary Benecke	Attendant .....(R. & B.)	22 00
Melvina Walter	Attendant .....(R. & B.)	22 00
Bertha Meyers	Attendant .....(R. & B.)	30 00
L. Gertraude Murnby	Attendant .....(R. & B.)	25 00
Martha Schuppert	Attendant .....(R. & B.)	30 00
Dora Lee Blaisdell	Attendant .....(R. & B.)	20 00
Anna Cramer	Attendant .....(R. & B.)	20 00
Emma Austin	Attendant .....(R. & B.)	20 00
Flossie Frank	Attendant .....(R. & B.)	20 00
Emma Elaner	Attendant .....(R. & B.)	20 00
Jennie O'Hern	Attendant .....(R. & B.)	20 00
Barbara English	Attendant .....(R. & B.)	20 00

Roster of Employes in the Classified Service.

NORTHERN HOSPITAL FOR THE INSANE—Continued.

Name.	Position.	Compensation.
COMPETITIVE CLASS.		
Katie Krause	Attendant .....(R. & B.)	20 00
Harriet Granger	Attendant .....(R. & B.)	20 00
Marie Cameron	Attendant .....(R. & B.)	20 00
Mabel Bergstrom	Attendant .....(R. & B.)	20 00
Sadie Kenyon	Attendant .....(R. & B.)	20 00
Jennie Dale	Attendant .....(R. & B.)	20 00
Katherine Nemacheck	Attendant .....(R. & B.)	20 00
A. Johnson	Carpenter .....(R. & B.)	60 00
Charles Hanson	Cook, rear .....(B.)	60 00
Frank R. Barlow	Engineer	90 00
Frank M. Bemis	Assistant Engineer .....(B.)	50 00
C. A. Griffin	Night Engineer .....(R. & B.)	50 00
B. C. Olson	Fireman .....(R. & B.)	35 00
Emil Hidde	Fireman .....(B.)	35 00
William H. Clough	Fireman .....(B.)	35 00
John Davis	Gardener .....(B.)	65 00
Julius Pistol	Mason .....(B.)	65 00
E. W. Payn	Night Watch .....(R. & B.)	35 00
Louis Martinson	Night Watch .....(B.)	31 00
Elmer Hansen	Night Watch .....(R. & B.)	30 00
Henry Pufahl	Night Watch .....(R. & B.)	26 00
J. C. Ashdown	Night Watch .....(B.)	30 00
Celia Spellman	Night Watch .....(R. & B.)	20 00
Anna Elsner	Night Watch .....(R. & B.)	20 00
Anna Moore	Night Watch .....(R. & B.)	22 00
Abbie Foster	Night Watch .....(R. & B.)	25 00
Emma Regolin	Night Watch .....(R. & B.)	21 00
J. T. Harwood	Painter .....(R. & B.)	50 00
Louise Gehrke	Attendant .....(R. & B.)	20 00
Elizabeth Rook	Teacher	30 00
Charles J. Reagen	Attendant .....(R. & B.)	25 00
Amanda Van Seggern	Attendant .....(R. & B.)	20 00
Edward Malouf	Attendant .....(R. & B.)	25 00
Elizabeth Suchy	Attendant .....(R. & B.)	20 00
Matt. McIntyre	Attendant .....(R. & B.)	30 00
William Rang	Attendant .....(R. & B.)	25 00

LABOR CLASS.

Thirty-three positions, compensation ranging from \$13 to \$40 per month.

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Roster of Employees in the Classified Service.

STATE HOSPITAL FOR THE INSANE.

Name.	Position.	Compensation.
EXEMPT CLASS.		
Chas. Gorst	Superintendent	\$308 38
M. E. Archer.....	Stenographer	30 00
NON-COMPETITIVE CLASS.		
P. D. Cramer.....	Steward	\$100 00
Marv Handschin	Matron	41 67
COMPETITIVE CLASS.		
Eugene Cheney	Physician, 1st Asst.	\$125 00
M. K. Green	Physician, 2d Asst.	83 33
Aug. Sauthoff	Physician, 3d Asst.	75 00
D. C. Hayward	Steward, Asst.	50 00
A. C. Nordvi	Druggist	40 00
C. Christensen	Supervisor	45 00
Geo. S. Hansen	Supervisor, Asst.	35 00
M. A. Sanders.....	Supervisress	35 00
Fannie Christensen	Supervisress Asst.	30 00
John Engen	Attendant	29 00
P. V. G. Esterley.....	Attendant	29 00
L. L. Marsh	Attendant	31 00
R. L. Powell.....	Attendant	30 00
D. F. Kelliher	Attendant	29 00
F. F. Greenway.....	Attendant	29 00
Herman Soule	Attendant	25 00
Carl Bredeson	Attendant	25 00
Hugh Weller	Attendant	25 00
Roy Ridehover	Attendant	25 00
H. Berg	Attendant	26 00
Frank Goodwin	Attendant	26 00
Edward Dubols	Attendant	25 00
Andrew Pilch	Attendant	25 00
J. Gaul	Attendant	33 00
Wm. Robinson	Attendant	26 00
Glen Wilson	Attendant	25 00
Frank Reynolds	Attendant	25 00
J. Elmer Aiken	Attendant	25 00
John Sundberg	Attendant	25 00
W. W. Fountain	Attendant	25 00
Emery L. Knight	Attendant	25 00
Anton Olson	Attendant	25 00
Robert C. Smith	Attendant	25 00
D. P. Alexander	Attendant	25 00
Mabel F. Harvey	Attendant	24 00
Frederike Engen	Attendant	22 00
Lillian Greenleaf	Attendant	23 00
Nealie Hooseman	Attendant	22 00
Winifred Merwin	Attendant	22 00
Susie Minnehan	Attendant	20 00
Katie Nevins	Attendant	22 00
Marie Gatsenberg	Attendant	21 00
Jessica Williams	Attendant	20 00
Maggie Schleck	Attendant	22 00
Minnie Welsh	Attendant	24 00
Lena McEncroe	Attendant	24 00
Blanch J. Knight	Attendant	20 00
Marie T. Juvet	Attendant	20 00
Mabel Goodwin	Attendant	20 00
Margaret Krause	Attendant	20 00
Muriel Berg	Attendant	20 00
Tella Vancil	Attendant	26 00
Francis Du Bois	Attendant	20 00
Linnie Young	Attendant	20 00
Dessa Huttenow	Attendant	20 00
Evelyn Cooper	Attendant	20 00
Annetta Alexander	Attendant	20 00
Margaret Maurer	Attendant	20 00

Roster of Employes in the Classified Service.

STATE HOSPITAL FOR THE INSANE—Continued.

Name.	Position.	Compensation.
COMPETITIVE CLASS.		
Alice Fay	Asst. Center	(R. & B.) 16 00
Nannie Murphy	Asst. Center	(R. & B.) 17 00
Julia Sullivan	Asst. Center	(R. & B.) 16 00
Mayme Stedder	Asst. Center	(R. & B.) 16 00
Anna O'Brien	Asst. Center	(R. & B.) 16 00
Mamie Kelley	Attendant	(R. & B.) 20 00
Edward Johnson	Asst. Rear	(R. & B.) 22 00
Mrs. T. Anderson	Asst. Rear	(R. & B.) 17 00
Edward Baumgardner	Asst. Rear	(R. & B.) 30 00
Charlotte Baumgardner	Asst. Rear	(R. & B.) 20 00
Ida Lunde	Asst. Rear	(R. & B.) 18 00
Mary Dippolt	Asst. Rear	(R. & B.) 20 00
Lizzie Droste	Asst. Rear	(R. & B.) 16 00
Mary Krakora	Asst. Rear	(R. & B.) 18 00
Wm. Free	Carpenter	(R. & B.) 50 00
John Elchman	Rear	(R. & B.) 55 00
Clarence Willis	Engineer	(R. & B.) 80 00
Mike Toban	Engineer, Asst.	(R. & B.) 40 00
F. E. Baldwin	Engineer, Asst.	(R. & B.) 50 00
Henry Dott	Fireman	(R. & B.) 30 00
Chas. Hornbeck	Fireman	(R. & B.) 30 00
G. I. Farwell	Fireman	(R. & B.) 30 00
J. L. Farwell	Fireman	(R. & B.) 30 00
O. E. Gumz	Laundrer	(R. & B.) 40 00
Engvold Bolstad	Mason	(R. & B.) 60 00
John U. Braun	Farmer	(R. & B.) 50 00
C. B. Helm	Night Watch	(R. & B.) 21 00
Alfred Watson	Night Watch	(R. & B.) 26 00
Fred S. Porter	Night Watch	(R. & B.) 28 00
E. P. Gustlin	Night Watch	(R. & B.) 31 00
Josie Johnson	Night Watch	(R. & B.) 20 00
Maud Cutler	Night Watch	(R. & B.) 21 00
Wm. Chapel	Night Watch	(R. & B.) 29 00
Iva Tracy	Night Watch	(R. & B.) 21 00
Laura Rintelmann	Night Watch	(R. & B.) 22 00
Fattie Salefsky	Night Watch	(R. & B.) 24 00
LABOR CLASS.		
C. F. Olson	Barber	(R. & B.) \$30 00
John Dippolt	Barman	(R. & B.) 25 00
Patrick Welch	Butcher	(R. & B.) 30 00
Mrs. D. J. Murphy	Book Center	(R. & B.) 28 00
Anna Breitenbach	Book Center	(R. & B.) 16 00
Agnes Powers	Book Rear	(R. & B.) 30 00
Mrs. Uriah Walte	Book Rear	(R. & B.) 25 00
Anna Johnston	Book Rear	(R. & B.) 22 00
Pat Mullarkey	Cowman	(R. & B.) 24 00
Marcus Johnson	Carman	(R. & B.) 23 00
Chas. Sheppler	Drayman	(R. & B.) 22 00
Aug. Brantz	Gardener	(R. & B.) 40 00
Hugh Guthrie	Laborer	(R. & B.) 25 00
Bertha Gumz	Laundress	(R. & B.) 20 00
Katherine Healy	Laundress	(R. & B.) 15 00
Nellie Murphy	Laundress	(R. & B.) 15 00
Alice Vopalensky	Laundress	(R. & B.) 15 00
Edith Vopalensky	Laundress	(R. & B.) 15 00
Louis Scheppler	Lawman	(R. & B.) 45 00
Agnes Mooney	Seamstress	(R. & B.) 17 00
Anna Knebel	Seamstress	(R. & B.) 19 00
Mrs. H. Rollins	Seamstress	(R. & B.) 19 00
Aug. Yanke	Tailor	(R. & B.) 15 00
Patrick Joyce	Teamster	(R. & B.) 24 00
Bob Welsh	Teamster	(R. & B.) 25 00
Frank Goodspeed	Teamster	(R. & B.) 25 00
H. J. Greenfield	Upholsterer	(R. & B.) 40 00

Roster of Employees in the Classified Service.

WISCONSIN STATE PRISON.

Name.	Position.	Compensation.
EXEMPT CLASS.		
Henry Town	Warden (R. & B.)	\$166 67
Rev. G. W. Pepper.....	Chaplain (Cath.)	16 66
Rev. S. J. Dowling.....	Chaplain (Prot.)	76 66
NON-COMPETITIVE CLASS.		
J. N. Baumel.....	Act. Deputy Warden..... (R. & B.)	\$83 33
Mrs. M. H. Schilling.....	Matron..... (R. & B.)	45 40
COMPETITIVE CLASS.		
Guy Taft	Act. Asst. Dep. Warden..... (R.)	\$70 00
Jacob Fuss	Chief Clerk	93 33
G. A. Benson	Record Clerk	70 00
Dr. J. F. Brown	Physician	135 00
Edward Kerstell	Keeper S. Cell Room..... (R.)	60 00
Willis A. Yarham	Keeper N. Cell Room..... (R.)	60 00
Chas. H. Linsley	Keeper Knit. Shop..... (R.)	60 00
John Kerrigan	Keeper Knit. Shop..... (R.)	60 00
Wm. L. Zweiger	Keeper Knit. Shop..... (R.)	60 00
H. J. Miller	Keeper Knit. Shop..... (R.)	60 00
John Dic.	Keeper Knit. Shop..... (R.)	60 00
Daniel Gallagher	Keeper Knit. Shop..... (R.)	60 00
Henry J. Meeuk.....	Keeper Knit. Shop..... (R.)	60 00
Wm. J. Hinkamp.....	Keeper Knit. Shop..... (R.)	60 00
Wm. A. Graves	Keeper Knit. Shop..... (R.)	60 00
John D. Smith	Keeper Knit. Shop..... (R.)	60 00
E. D. Town	Keeper Knit. Shop..... (R.)	60 00
John De Vos	Keeper Knit. Shop..... (R.)	60 00
Frank Benway	Keeper Knit. Shop..... (R.)	60 00
E. Erickson	Keeper Tailorshop..... (R.)	65 00
W. D. Graves	Keeper Tailorshop..... (R.)	60 00
Fred Moul	Keeper, Special	60 00
J. V. Eberlien.....	Keeper	60 00
J. R. Brower	Keeper Laundry	53 75
Robt. Hadfield.....	Chief Engineer	90 00
Louis Riordan	Asst. Engineer..... (R.)	60 00
Byron Sigler	Light Engineer	60 00
Walter A. Bayley.....	Overseer Kitchen	66 75
Thomas Green	Storekeeper	66 75
George Steck	Mason	65 00
A. L. Penfield	Carpenter	70 00
W. C. Fuller	Farmer	60 00
F. A. McElroy.....	Asst. Farmer	53 75
Hobart Baker	Night Captain	61 40
Paul Huntzinger	Night Guard, Cell Room..... (R.)	60 00
Wm. Brennehan	Night Guard, Cell Room..... (R.)	60 00
F. L. Beal	Night Guard, Cell Room..... (R.)	60 00
A. T. Viel	Night Guard, Office..... (R.)	60 00
Phineas Claffin	Night Guard, Hospital..... (R.)	60 00
R. H. Pepper.....	Night Guard, Old Men's Ward..... (R.)	60 00
Thos. Purcell	Night Guard, Special..... (R.)	60 00
John Hiles.....	Yardman	60 00
Andrew Sunne	Guard, Hospital..... (R.)	53 75
Max Fuss	Guard, Office..... (R.)	53 75
Datus E. Wilber.....	Guard, Front Gate..... (R.)	53 75
Byron Harney	Wall Guard	53 75
Chas. S. Brooks.....	Wall Guard	53 75
E. L. Young.....	Wall Guard	53 75
Stephen Rickard	Wall Guard	53 75
LABOR CLASS.		
Mrs. Annie Balerile.....	Servant (R. & B.)	11 00

Roster of Employees in the Classified Service.

HOME FOR THE FEEBLE MINDED.

Name.	Position.	Compensation.
EXEMPT CLASS.		
Belle B. Saxton.....	Stenographer .....(R. & B.)	\$30 00
NON-COMPETITIVE CLASS.		
A. P. Niles.....	Asst. Steward .....(R. & B.)	\$75 00
Hattie Searles, Mrs.....	Matron .....(R. & B.)	35 00
E. J. Boyce, Mrs.....	Matron .....(R. & B.)	30 00
W. R. Taylor, Mrs.....	Matron .....(R. & B.)	35 00
H. L. Buxton, Mrs.....	Matron .....(R. & B.)	35 00
S. J. Jenkins, Mrs.....	Matron .....(R. & B.)	40 00
M. R. Voight, Mrs.....	Matron .....(R. & B.)	30 00
COMPETITIVE CLASS.		
E. M. Wilson.....	Physician.....	\$125 00
A. A. Gaynor.....	Teacher Training.....	50 00
Aug. Peeper.....	Teacher Band.....(D.)	40 00
Bessie J. Savage.....	Teacher Sloyd.....(R. & B.)	40 00
Theophilus Roemer.....	Teacher Prin.....(R. & B.)	40 00
Emma C. Johnson.....	Teacher Sewing.....(R. & B.)	35 00
Charlotte J. Preuss.....	Teacher Kgt.....(R. & B.)	35 00
Bertha A. Cheever.....	Teacher Grls.....(R. & B.)	33 00
Gretta E. Dalton.....	Teacher Kgt.....(R. & B.)	30 00
Charles Gillette.....	Teacher Att.....(R. & B.)	30 00
Andrew Anderson.....	Shoemaker.....(R. & B.)	40 00
H. W. Busch.....	Carpenter.....(R. & B.)	60 00
Luther Forsyth.....	Engineer.....	70 00
John Mitchell.....	Assistant Engineer.....	60 00
Frank E. Titus.....	Assistant Engineer.....(R. & B.)	45 00
Ernest Flint.....	Fireman.....(R. & B.)	35 00
Chas. Guse.....	Fireman.....(R. & B.)	35 00
Thos. McDonald.....	Steamfitter.....(D.)	52 00
F. O. Bible.....	Gardner.....(R. & B.)	50 00
Martin Peterson.....	Foreman.....(D.)	65 00
A. F. Brady.....	Night Watch.....	42 00
Joseph Crowley.....	Night Watch.....	38 00
Una Harding.....	Night Watch.....(R. & B.)	23 00
Wm. Scheuer.....	Attendant.....(R. & B.)	32 00
Emery Butterfield.....	Attendant.....(R. & B.)	30 00
Carl Hanson.....	Attendant.....(R. & B.)	29 00
W. O. White.....	Attendant.....(R. & B.)	27 00
Harry E. Ross.....	Attendant.....(R. & B.)	27 00
Perry L. Weaver.....	Attendant.....(R. & B.)	27 00
Wilfred Heaslett.....	Attendant.....(R. & B.)	27 00
Terrence J. Knight.....	Attendant.....(R. & B.)	24 00
D. B. Briede.....	Attendant.....(R. & B.)	23 00
Charles Cardinal.....	Attendant.....(R. & B.)	23 00
Rolla Moore.....	Attendant.....(R. & B.)	22 00
Myron Kenyon.....	Attendant.....(R. & B.)	21 00
Chas. Briede.....	Attendant.....(R. & B.)	21 00
Lily Murphy.....	Attendant.....(R. & B.)	24 00
Jennie Daetsch.....	Attendant.....(R. & B.)	24 00
Nellie Doittle.....	Attendant.....(R. & B.)	24 00
Addie Williams.....	Attendant.....(R. & B.)	24 00
Edith Zapp.....	Attendant.....(R. & B.)	23 00
Bess Elliott.....	Attendant.....(R. & B.)	22 00
Ethel Browning.....	Attendant.....(R. & B.)	20 00
Mina Brown.....	Attendant.....(R. & B.)	20 00
Lizzie Telch.....	Attendant.....(R. & B.)	20 00
Lydia Lintz.....	Attendant.....(R. & B.)	20 00
Cella Erd.....	Attendant.....(R. & B.)	20 00
Anna Kruger.....	Attendant.....(R. & B.)	20 00
Mame Groat.....	Attendant.....(R. & B.)	19 00
Ethel Penney.....	Attendant.....(R. & B.)	19 00
Ella Smith.....	Attendant.....(R. & B.)	19 00
Mary White.....	Attendant.....(R. & B.)	18 00

Roster of Employes in the Classified Service.

HOME FOR THE FEEBLE MINDED—Continued.

Name.	Position.	Compensation.
COMPETITIVE CLASS.		
Kate Yaeger	Attendant (R. & B.)	18 00
Emma Hanson	Attendant (R. & B.)	18 00
Addie Safford	Attendant (R. & B.)	18 00
Phyllis Daltsch	Attendant (R. & B.)	17 00
Ruth Matchette	Attendant (R. & B.)	17 00
Elsie Heaslett	Attendant (R. & B.)	17 00
Anna Heinzel	Attendant (R. & B.)	16 00
Rebecca Gilgen	Attendant (R. & B.)	16 00
Emma Pfughoeft	Attendant (R. & B.)	16 00
Mary Anderson	Attendant (R. & B.)	16 00
Ida Webb	Attendant (R. & B.)	18 00
Clytie Harless	Attendant (R. & B.)	16 00
Estelle Rood	Attendant (R. & B.)	15 00
Alice Odeklrk	Attendant (R. & B.)	15 00
Marion Blain	Attendant (R. & B.)	15 00
Lizzie Wilkom	Attendant (R. & B.)	15 00
Mildred Johnston	Attendant (R. & B.)	15 00
Gertrude Kane	Attendant (R. & B.)	15 00
Louise Charest	Attendant (R. & B.)	15 00
Alice Robertson	Attendant (R. & B.)	15 00
Katherine Guldon	Attendant (R. & B.)	15 00
Lydia Gelts	Attendant (R. & B.)	15 00
Edward Beckham	Steamfitter, per day (R. & B.)	3 50
Charles Gillette	Teacher Attendant (R. & B.)	30 00
Nels Skogg	Steamfitter, per day (R. & B.)	3 50
Bessie Marshall	Attendant (R. & B.)	18 00
Johanna Peterson	Center (R. & B.)	19 00
Lauretta Zoelle	Attendant (R. & B.)	18 00
Emily Klippinger	Attendant (R. & B.)	18 00

LABOR CLASS.

Sixty-three positions, compensations ranging from \$16 to \$70 per month.

Roster of Employes in the Classified Service.

WISCONSIN INDUSTRIAL SCHOOL FOR BOYS.

Na me.	Position.	Compen- sation.
EXEMPT CLASS.		
Hughes, Ada.....	Stenographer .....(R. & B.)	\$25 00
NON-COMPETITIVE CLASS.		
Mersch, Mrs. W. F.....	Family Matron .....(R. & B.)	\$20 00
Blackmun, Mrs. R. M.....	Family Matron .....(R. & B.)	20 00
Booth, Helen B.	Family Matron .....(R. & B.)	25 00
Bornheimer, Mary.....	Family Matron .....(R. & B.)	20 00
Bryant, Anna R.....	Family Matron .....(R. & B.)	20 00
Phillip, Belf.....	Family Matron .....(R. & B.)	20 00
Crocker, M. L.....	Family Matron .....(R. & B.)	20 00
Hillier, Nora.....	Family Matron .....(R. & B.)	20 00
Hutton, mrs. A. J.....	Family Matron .....(R. & B.)	41 66
Noble, J. B.....	Physician	40 00
Rawson, H. R.....	State Agent	83 33
Huebling, E. H.....	Superintendent, Assistant and Stew- ard Assistant .....(R. & B.)	100 00
COMPETITIVE CLASS.		
Ham, Joseph.....	Baker .....(B.)	\$70 00
Andree, Al.....	Carpenter .....(B.)	50 00
Grover, A. A.....	Engineer .....(B.)	75 00
Schock, J. B.....	Engineer, day .....(R. & B.)	50 00
Klatt, Julius C.....	Engineer, night .....(B.)	45 00
Mersch, W. F.....	Family Officer and Teacher (R. & B.)	40 00
Blackmun, Roy M.....	Family Officer and Teacher (R. & B.)	40 00
Booth, R. D.....	Family Officer and Teacher (R. & B.)	60 00
Coutchle, V.....	Family Officer and Teacher (R. & B.)	40 00
Bryant, D. E.....	Family Officer and Teacher (R. & B.)	50 00
Phillip, H. E.....	Family Officer and Teacher (R. & B.)	50 00
Crocker, L. A.....	Family Officer and Teacher (R. & B.)	40 00
Hillier, R. J.....	Family Officer and Teacher (R. & B.)	50 00
Dousman, K. C.....	Farm and Stock .....(R. & B.)	45 00
Elliott, A. J.....	Laundry .....(B.)	55 00
Froemming, C. H.....	Manual Training .....(B.)	60 00
Waterman, Carl.....	Music Teacher .....(R. & B.)	50 00
Owens, T. G.....	Nightwatch .....(B.)	40 00
Hanaman, G. B.....	Painter and Blacksmith .....(B.)	50 00
Roessler, J. S.....	Principal .....(B.)	100 00
Pilkowitz, Sam.....	Shoe Shop .....(B.)	50 00
Severs, Peter.....	Tailor .....(B.)	60 00
Haynes, Henrietta.....	Teacher .....(R. & B.)	30 00
Burk, M. T.....	Teacher .....(R. & B.)	40 00

LABOR CLASS.

Thirteen positions. compensations ranging from \$20 to \$40 per month. All room and board.

Roster of Employees in the Classified Service.

SCHOOL FOR THE BLIND.

Name.	Position.	Compensation.
EXEMPT CLASS.		
Frances E. Ryan.....	Assistant Steward .....(R. & B.)	\$40 00
NON-COMPETITIVE CLASS.		
Pruella H. Clark.....	Matron .....(R. & B.)	\$41 66
Ada Huss	Assistant Matron .....(R. & B.)	40 00
Margaret K. Davidson.....	Supervisor .....(R. & B.)	20 00
COMPETITIVE CLASS.		
M. Ada Turner.....	Physical Culture .....(R. & B.)	\$40 00
Joanna H. Jones.....	Piano .....(R. & B.)	50 00
Laura Engleson	Piano .....(R. & B.)	25 00
Adele B. Medlar.....	Vocal .....(R. & B.)	40 00
Herbert Adams.....	Orchestra	45 00
Robt. J. Harvey.....	Tuning .....(R. & B.)	40 00
H. G. Arnold.....	Teacher work .....(R. & B.)	35 00
Joseph Siehr.....	Teacher work	35 00
Elizabeth McGrath.....	Kindergarten .....(R. & B.)	40 00
M. William Heckmann.....	Manual Training .....(R. & B.)	50 00
Anna Moore	Literary Teacher .....(R. & B.)	40 00
Alice McGregor	Literary .....(R. & B.)	40 00
T. J. Crew	Literary .....(R. & B.)	50 00
Helen Tuttle	Literary .....(R. & B.)	40 00
Alma Hurling	Cooking .....(R. & B.)	35 00
A. J. Hogan	Engineer .....(B.)	60 00
Fred A. Bulman	Engineer .....(B.)	50 00
Henry F. Bull	Fireman .....(B.)	45 00
James J. Rourke	Gardener .....(R. & B.)	35 00
Daniel Shaefer	Watchman .....(B.)	35 00

LABOR CLASS.

Twenty positions, compensations ranging from \$15 to \$30 per month. All room and board.

Roster of Employees in the Classified Service.

SCHOOL FOR THE DEAF.

Name.	Position.	Compensation.
EXEMPT CLASS.		
Nellie M. Passage	Stenographer	\$25 00
NON-COMPETITIVE CLASS.		
E. D. Flske	Assistant Steward	\$55 00
Mrs. E. W. Walker	Matron	41 68
Thelmaannon	Assistant Matron	30 00
E. J. Vincent	Boys' Supervisor	40 00
Elizabeth Campbell	Assistant Boys' Supervisor	22 00
COMPETITIVE CLASS.		
W. M. Stillman	Engineer	\$65 00
John Moore	Assistant Engineer	47 50
Theo. Gilbert	Fireman	42 50
J. C. Ekert	Carpenter	80 00
F. C. Larsen	Printer	65 00
Louis Snerron	Shoemaker	50 00
G. W. Kirk	Baker	50 00
B. B. Keith	Watchman	40 00
W. A. Cochrane	Teacher	110 00
W. F. Gray	Teacher	100 00
Seth W. Gregory	Teacher	100 00
Warren Robinson	Teacher	100 00
H. A. Congdon	Teacher	100 00
Paul Lange	Teacher	95 00
Thos. Magerty	Teacher	80 00
F. J. Neesam	Teacher	50 00
A. I. Hobart	Teacher	70 00
Elsie M. Steinke	Teacher	65 00
Lillian M. Sorrenson	Teacher	65 00
M. D. Fonner	Teacher	65 00
Alice T. Coburn	Teacher	65 00
Elizabeth Rhodes	Teacher	65 00
Frances E. Fowler	Teacher	65 00
Ethelwyn Hammond	Teacher	50 00
Mary Williams	Teacher	60 00
Kathrine Williams	Teacher	55 00
Katherine Williams	Milliner	10 00
Matie Winston	Teacher	55 00
Winifred Hammond	Teacher	40 00
Clara Henderson	Teacher	45 00
Edith Fitzgerald	Teacher	35 00
Julia Carney	Teacher	20 00
Mildred Lloyd	Teacher	25 00

LABOR CLASS.

Twelve positions, compensations ranging from \$14 to \$27 per month. Women teachers are given dinners on school days.

Roster of Employes in the Classified Service.

STATE PUBLIC SCHOOL FOR DEPENDENT CHILDREN.

Name.	Position.	Compensation.
EXEMPT CLASS.		
Julia Goodsell	Stenographer .....(R. & B.)	\$30 00
NON-COMPETITIVE CLASS.		
A. F. Brandt.....	State Agent .....(R. & B.)	\$83 33
Elsie M. Loomis.....	State Agent .....(R. & B.)	75 00
Dr. W. T. Sarles.....	Physician	50 00
Isabel C. Park.....	General Matron .....(R. & B.)	41 67
Margaret Norton	Assistant Steward .....(R. & B.)	45 00
Carrie Scott	Matron "A" .....(R. & B.)	30 00
Angie L. Fanning.....	Matron "B" .....(R. & B.)	30 00
Emma F. Strain.....	Matron "C" .....(R. & B.)	30 00
May Masters	Matron "D" .....(R. & B.)	30 00
Mary Evans.....	Matron "E" .....(R. & B.)	30 00
Helen E. Mitchell.....	Matron, Hospital .....(R. & B.)	30 00
D. G. Williams.....	Boys' Supervisor .....(R. & B.)	45 00
COMPETITIVE CLASS.		
Edna L. Jones	Teacher .....(R. & B.)	\$30 00
Alice M. Bushey	Teacher .....(R. & B.)	30 00
Margaret Harris	Teacher .....(R. & B.)	30 00
Henrietta Zander	Teacher .....(R. & B.)	30 00
Caroline Harris.....	Teacher .....(R. & B.)	30 00
J. C. Venus.....	Engineer .....(House)	60 00
G. A. Reece	Fireman .....(R. & B.)	30 00
H. A. Ranum	Baker and Cook .....(B.)	60 00
Joseph Blakeney	Nightwatch	40 00

LABOR CLASS.

Twenty-three positions, compensations ranging from \$12 to \$35 per month.

Roster of Employes in the Classified Service.

GREEN BAY REFORMATORY.

Name.	Position.	Compensation.
NON-COMPETITIVE CLASS.		
O. E. Bickford.....	Assistant Superintendent (Products of Farm)	\$125 00
COMPETITIVE CLASS.		
T. J. Bast.....	Clerk	\$85 00
H. K. Christianson.....	Tailor	60 00
W. C. Jens.....	Foreman	100 00
Jos. Welles.....	Foreman	55 00
F. E. Rice.....	Kitchen Overseer	60 00
J. W. Clark.....	Engineer	50 00
M. Gilger.....	Assistant Engineer	55 00
W. J. Kernin.....	Assistant Engineer	55 00
L. Williams.....	Farmer	60 00
F. H. Koch.....	Mason	65 00
J. A. Clifford.....	Teacher and Storekeeper ...	50 00
J. R. Junlon.....	Teacher Guard	60 00
S. W. Goss.....	Teacher Guard	60 00
H. B. Gross.....	Teacher Guard	50 00
Truman Brigham.....	Teacher Guard	60 00
G. C. Maigatter.....	Teacher Guard	50 00
B. Dodge.....	Guard	45 00
Wallace Young.....	Guard	55 00
Frank Boyd.....	Guard	45 00
W. A. Handyside.....	Guard	55 00
J. P. England.....	Guard	45 00
E. E. Chamberlain.....	Brickmaker	70 00
David Killey.....	Night Guard	45 00
C. A. Watson.....	Night Guard	45 00
Robt. W. Miller.....	Night Guard	45 00

LABOR CLASS.

One position, compensation, \$15 per month. Room and board.

Roster of Employees in the Classified Service.

WORKSHOP FOR THE BLIND.

Name.	Position.	Compensation.
COMPETITIVE CLASS.		
Oscar Kuestermann	Overseer	\$100 00
William Schroeder	Teacher	60 00
Michael Zana	Teacher	50 00
John Menning	Teacher	45 00

TUBERCULOSIS SANITARIUM.

Name.	Position.	Compensation.
COMPETITIVE CLASS.		
J. E. Hoyt.....	Superintendent of Construction	\$100 00

INDUSTRIAL SCHOOL FOR GIRLS.

Name.	Position.	Compensation.
COMPETITIVE CLASS.		
Peter James.....	Gardener	\$35 00
Sidney Denkin	Engineer	40 00
Ida C. Parks.....	Dressmaker	30 00
Della D. Cutting.....	Cooking School Teacher	35 00

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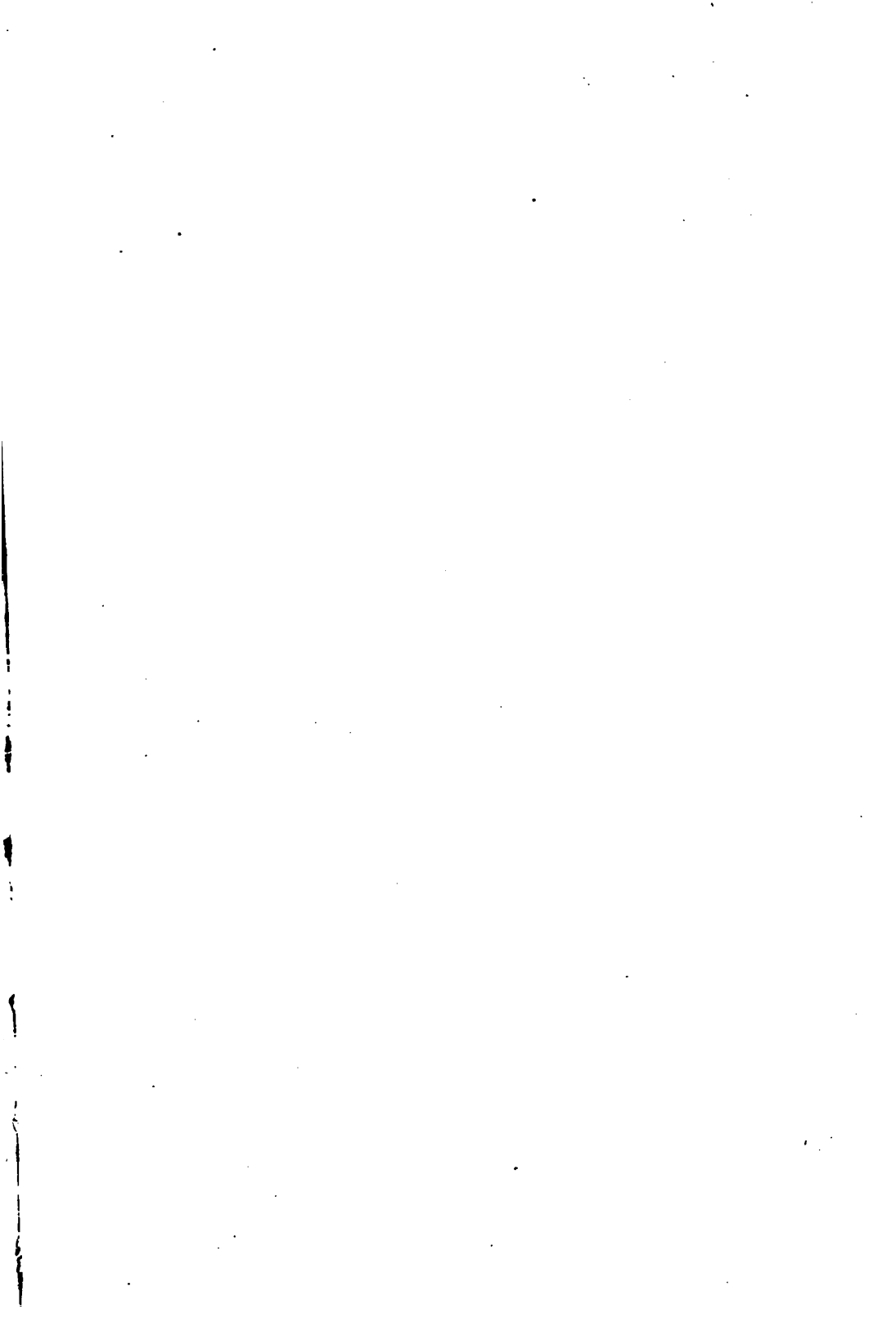
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